

1895

1936



C.I.T. to Finance Dealers' Trade-Ins

Loans Will Be Made On Used Car Stocks Based On NADA Average Value

The C. I. T. Corp., unit of Commercial Investment Trust Corp., has announced its "Quick Turn-Over Plan" for used cars. This plan, in brief, will provide dealers with immediate cash for a substantial portion of the N. A. D. A. average value of a single used car taken by the dealer in trade-in against the sale of a new car.

Dealers working under this plan need not have a large stock of used cars in order to plan floor inventory, as dealers doing only a small volume of business will be accommodated. In the case of a sale involving an unusually high trade-in, the dealer will furnish his local C. I. T. branch the details of the transaction. The N. A. D. A. average value of the used car will be determined and the finance company branch will send the dealer a check for
(Turn to page 170, please)

Bendix Attacks Wagner Act as Unconstitutional

Bendix Products Corp. has filed a petition in the Federal Court at Chicago for an injunction against the National Labor Relations Board, contending that the Wagner Labor Relations Act is unconstitutional. A hearing has been set for Feb. 11. The bill stated that the regional labor board had ordered an election among the company's employees to determine whether they should be represented by the International Automobile Workers of America or the Bendix Employees Association.

Chevrolet Extends Used-Car Junking Plan Through Feb.

Success of Chevrolet's million-dollar used car disposal plan as an aid to dealers, and widespread public endorsement of it as a contributor to traffic safety, have led to its extension through the month of February, W. E. Holler, vice-president and general sales manager of the Chevrolet Motor Co., announced this week. The plan was originally announced for the month of January only.

Under its provisions, Chevrolet is paying its dealers for every unsafe old

In This Issue

	Page
<i>Developments in Soviet Russia</i>	178
<i>Flywheels Machined in Two Operations</i>	182
<i>Hydraulic Valve Lifter is Self Adjusting</i>	183
<i>Behavior of the Automobile During Depression</i> ..	184
<i>Eight-Wheel Truck for 40,000-lb. Loads</i>	193

car taken in trade and scrapped. Besides helping to clear streets of the traffic hazard which such vehicles represent, the program is making for a more wholesome car merchandising situation, Mr. Holler asserted. This is being reflected in Chevrolet's sales records.

"With the million-dollar used car disposal program in operation from coast to coast," said Mr. Holler, "Chevrolet has established an all-time record for January in its used car sales. Eighty-two thousand and fifty-five units were sold in the first 20 days of January, our latest figures show, setting a new record of 315,806 for the period that has elapsed since Chevrolet's new car announcement in November."

Price Rise Likely on Machine Tools

Makers Consider Ten to Fifteen Per Cent Advance to Offset Rising Costs

Discussions are now under way among executives of a number of machine tool manufacturing companies, with a view to an upward adjustment in prices, it was learned in Cleveland this week. The general consensus in the trade is that advances of 10 to 15 per cent will probably be made. The markup will probably not affect all lines equally and there seems little likelihood of a blanket increase, but it has become evident that there will be advances on a number of items during February.

Best informed sources declare manufacturing costs of almost all factory equipment and machinery are running 15 to 20 per cent higher than a year ago, with 1935 costs at least 15 per cent
(Turn to page 174, please)

Sales Heads Plan for March Upturn

Dealers Accumulate New Car Stocks, Expecting Sharp Spring Rebound

By HAROLD E. GRONSETH

With dealers now well stocked, production schedules of automobile manufacturers are following closely the trend of sales. Curtailment of retail demand occasioned by adverse weather conditions over widespread areas of the country has been reflected in prompt retrenchment of factory operations. Toward the end of January a shortened work week became the rule, rather than the exception, at automobile plants and among suppliers. Some dropped to four days a week or less, and others cut the hours per day.

The industry went into February with a somewhat slackened operating pace that awaited only a lift in retail demand to resume a quicker tempo. No attempt, of course, is made by the
(Turn to page 175, please)

W. S. Roberts Named Head of G. M. So. California Division

Alfred P. Sloan, Jr., president of General Motors, has announced the appointment of W. S. Roberts as general manager of the newly organized Southern California Division of GM Corp., which will operate an assembly plant now under construction at Los Angeles.

The plant, originally announced as the Argonaut Manufacturing Division, has been officially renamed the Southern California Division of GM Corp.

A.S.I. Show Dates Set For Week of Dec. 7-11

Action of the membership and marketing research committees and board of directors of N.S.P.A. which met in Detroit during the last week in January, resulted in the following highlights:

1. Unanimous vote in favor of holding the 1936 A.S.I. show during the week of Dec. 7-11.

2. Election to membership of 34 concerns, the addition of which to the N.S.P.A. Roster boosts its total to a
(Turn to page 174, please)

Detroit Unions to Vote on Federation

Proposed New Grouping Would Include Michigan Locals Only at First

Efforts to amalgamate independent labor unions in the motor industry having failed, leaders have turned back to the federation plan. At an informal meeting of representatives from the Associated Automobile Workers of America and the Mechanics Educational Society, Tuesday night, it was decided to put the federation proposal to a vote of the various locals. A meeting has been called for Feb. 15 at which each local will be represented by two delegates who will report on the vote.

Meanwhile leaders of the two unions will proceed on the basis that the organizations are federated, as the need for harmony and more cordial relations is well recognized by members.

The new federation will start out as a movement affecting only the Detroit area which is considered to include also Pontiac, Flint and Lansing. Out-of-state locals will not take part unless

and until they desire. Each union is to maintain its own identity and autonomy, but it is hoped that the new Federation will become a closer-knit organization than its predecessor, the Brotherhood of Allied Automobile Workers, which had evolved from the association of officers on the Wolman Boards.

American Tire Makers Hold World Markets Through Foreign Plants

The export business of American tire and tube manufacturers is steadily shrinking, not so much because of a proportionate falling off in foreign markets, as on account of the policy of American manufacturers in shifting production from their domestic factories to foreign countries where tire markets are brisk. Figures just compiled by the United States Department of Commerce reveal the fact that American tire exports in 1935 are a scant one-third of what they were a few years ago. The total number of passenger car, truck and bus casings exported last year was 1,095,880. Only a few years ago American exports averaged more than 3,500,000 units per year.

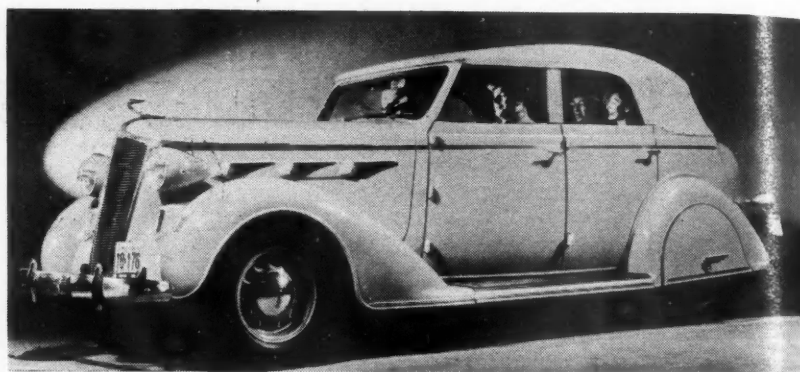
A check of the tire industry reveals the fact that American tire manufacturers have either branch tire factories, or tire manufacturing arrangements in ten foreign countries, in addition to Mexico and Canada. Six American manufacturers have Canadian factories which contribute more than 90 per cent of Canada's total tire output. Last year out of approximately 2,000,000 tires manufactured in Canada, more than 1,000,000 were exported. American manufacturers have transferred heavy portions of their export business from domestic plants to Canadian factories to take advantage of Canada's reciprocal empire tariff agreements. Goodyear, Goodrich, Fire-

stone, Seiberling, United States Rubber and General Tire have Canadian plants. Goodrich and General have manufacturing arrangements in Mexico.

Goodyear also has large factories in England, Argentina, Australia and Java and is reported to have recently completed negotiations whereby Goodyear tires will be manufactured in the British Dunlop Company's new factory in British East Africa. Firestone has penetrated the Spanish, Swiss and Argentine markets with local factories, and is now building a tire plant at Elizabethtown, British East Africa. Goodrich has a French factory and also maintains arrangements whereby its processes are used in tire building in England, Japan and in Montevideo, Uruguay. The Seiberling Rubber Co. of Akron has manufacturing alliances in South America and France.

American manufacturers say it has been necessary to build these foreign factories for several reasons—intense nationalistic tendencies in many countries, foreign exchange restrictions, and necessity of meeting competition, particularly in countries where British Dunlop and French Michelin interests have erected factories. While such policies have tended to reduce domestic operations they have enabled American companies to maintain their hold on foreign markets, manufacturers state.

The total value of American exports



New convertible sedan has been added to the De Soto Airstream line for 1936. Felt and rubber draft eliminators insure all-weather comfort, and the double frame is rigidly built to get rid of the rattle and noise once common in convertible bodies.

of tires and tubes of all kinds and of tire repair materials in 1935 was \$13,366,072.

High Clearance Wheels Offered on Dodge Truck

Special wheels 20 in. high, necessary in mountain and rural districts where muddy and rutted roads require greater axle clearance, are offered as optional equipment on the new 1936 Dodge ½-ton commercial cars, according to an announcement by Joseph D. Burke, director of truck sales for the Dodge division of Chrysler Corp. The commercial car on which these high wheels may be used has a special gear ratio of 4.8 to 1 to offset the larger circumference of the tires, 5.25 x 20 in.

With these high wheels and special gear ratio, Dodge ½-ton commercial cars easily negotiate unimproved roads in outlying districts where the clearance of the ordinary car may not be great enough to surmount obstacles encountered under such severe conditions. Axle clearance with these 20-in. wheels is 9½ in. 17/16 in. more than that of standard wheels.

New Car Sales in Canada Up 37 Per Cent in 1935

Canada reports an increase of 36.9 per cent in sales of new motor vehicles during 1935 and 32.8 per cent in retail value compared with the previous year. New motor vehicles sold numbered 100,403 valued at \$100,622,673, against 73,358 valued at \$75,785,461 in 1934. Of the total sales, passenger cars numbered 82,841 valued at \$8,017,147, and buses and trucks 17,562 with a value of \$17,605,526.

Ontario led the provinces with sales of 51,423 vehicles valued at \$51,847,594, and Quebec was second with 17,497 at \$17,852,096. The Maritime Provinces accounted for 7162 at \$7,262,569; Alberta 7057 at \$6,875,873; Manitoba 5643 at \$5,422,193; and Saskatchewan 4006 at \$3,832,534.

Mack Announces New Traffic-Type Models

Two New Chassis Lighter Than Company's Previous Cab-Over-Engine Types

Two additional "Traffic-Type" models (cab-over-engine), lighter than trucks of the type previously available in the Mack line, have been announced by Mack Trucks, Inc. Known as the EC and EB, the new trucks correspond in capacities and component parts to the conventional Mack models BG and BF, which have ratings of 1½-3 and 2-3½ tons respectively. In design and appearance they adhere closely to the present Mack Traffic-Type models CH and CJ, which have been in production for over two years. The new models are 3 ft. shorter than the corresponding conventional models, besides which they provide a one-third, two-thirds gross-weight distribution.

Both of the new models are powered by six-cylinder Mack engines, that in the EC having 3% by 5-in. cylinders and developing 79 hp. at the governed speed of 2300 r.p.m., while that in the EB has 3% by 5-in. cylinders and develops 92 hp. at the same governed speed.

Drive is taken from the dry single-plate clutch through a five-speed overgeared, or direct-in-fifth, unit-with-engine transmission, in which the third, fourth, and fifth speeds are through helical constant-mesh gears and toothed clutches.

Final drive on the Model EC is of the single-reduction spiral-bevel type, while the EB is provided with either a single-reduction or a dual reduction axle. All are full-floating with one-piece banjo housings with integral spring perches. The single-reduction housings are of pressed and fused steel, the dual-reduction housing a drop-forging of chrome-nickel steel, heat-treated. Axle shafts are of chrome-nickel steel with graduated heat-treatment.

The four-wheel brakes are actuated

Earnings Statements of Automotive Companies

Vehicle Manufacturers		1935	1934
Cord Corporation		*\$242,451	\$75,321
Hupp Motor Car Corp.		*2,029,015	*4,398,445
Nash Motors Co.		*610,227	*1,625,078
Paramount Motors Corp.		11,159	*79,900
Other Automotive Companies			
Black & Decker Mfg. Co. (3 mos. to Dec. 31)		178,328	52,818
Deere & Co.		6,105,452	379,734
Electric Auto-Lite Co.		†2,588,598	913,681
Fostoria Pressed Steel Corp.		*8,500	11,664
Pierce Governor Co.		36,121	*7,508
Stewart-Warner Corp.		†1,700,000	571,968
Miscellaneous			
Atlantic Refining Co.		3,970,600	5,512,105
Commercial Credit Corp.		7,800,133	5,391,133
Commercial Investment Trust Corp.		14,749,039	10,803,563
Sun Oil Co.		7,100,289	6,650,464

*—Net loss.

†—Preliminary.

by vacuum boosters and operate on drums of chrome-nickel iron. Foot-brake area is 427 sq. in. on the Model EC and 431 sq. in. on the Model EB. Hand brakes are mounted back of the transmission in both models.

Frames are of chrome-manganese, heat-treated pressed steel, the side rails being braced by tubular and channel cross members, and fastened permanently by hot riveting through jig-drilled and reamed holes. On the EC the frame dimensions are 87/16 by 3 by 7/32 in., while on the EB they are 8½ by 3 by ¼ in. Half-elliptic springs with two-stage helper springs at the rear are suspended in Mack rubber shock insulators, and front springs are controlled by Houdaille double-acting shock absorbers. The steering gear has a ratio of 18 to 1 on the EC and 21 to 1 on the EB. Fuel is carried in a 21-gal. rectangular tank supported by pressed-steel outriggers at the left of the frame just back of the cab. If necessary, a duplicate tank can be placed on the opposite side.

Longest Sodium-Lighted Road Opened in Northwest

The first installation of sodium lights in the Northwest has been made between Tacoma and Fort Lewis, Wash-

ington, where 66 10,000-lumen General Electric units have been staggered 200 feet apart along nearly three miles of four-lane Pacific highway. It is the largest installation in the United States at the present time. The East has the second largest installation, with 54 units in operation on the General Edwards bridge and its approaches at Lynn, Mass.

Since the American premiere of the sodium lamp in June, 1933, along a half-mile of the Balltown highway, near Schenectady, N. Y., General Electric luminaires have been installed in all sections of the country, in Hawaii, India, Spain, South Africa, Dutch East Indies, Brazil, and Canada.

Cleveland Hobbing Gives 25 New Shares for 1 Old

Increase in the authorized capital stock of the Cleveland Hobbing Machine Co. to 100,000 shares at \$4 par value from 4000 shares of no par and proposed exchange of present shares for new on the basis of 25 shares of new for one share of old, was announced this week. A quarterly dividend of 20 cents a share has been declared on the new stock, payable on April 1 to stockholders of record March 16.

J. R. Krause and Selden E. Kline, chairman and president of the First Cleveland Corp., were elected to the board of the Cleveland Hobbing Machine Co.

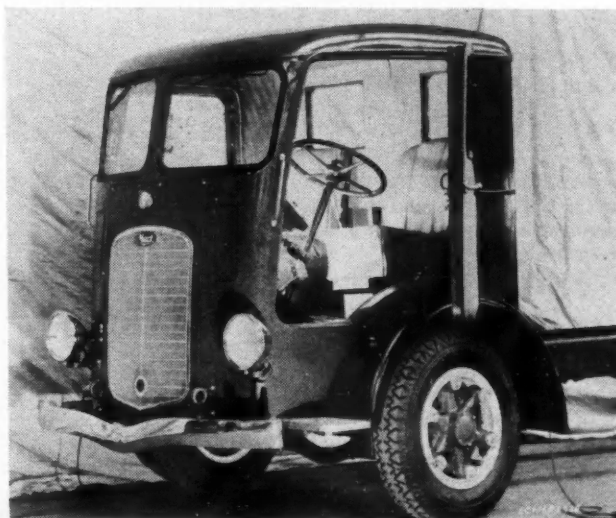
Fire Engine Shipments Totalled 540 Last Year

Fire-extinguishing equipment, as reported by practically all of the manufacturers to the Bureau of the Census, were as follows for the year 1935:

Pumping engines, by capacity groups, in gallons per minute:

Under 300	25
300-499	100
500-700	255
701-800	58
801-1000	15
Total	471

Mack Traffic-Type truck, Model EC, has adjustable driver's seat. Close-up shows location of engine enclosure and hand-brake mounted alongside the driver on the right.



C.I.T. to Finance Dealers' Trade-Ins

(Continued from page 167)

a substantial portion of that figure, which he can use as working capital.

Original documents are written for 60 days, which should give the dealer time to turn over the used car and yet keep finance charges at a minimum. Renewals, when necessary, may be obtained for 30 days if accompanied by a 10 per cent curtailment of the amount outstanding.

The C. I. T. has also announced that its "Late Model Used Car Plan" has been extended so as to apply the reduced rates and 18 months' maturities to used passenger cars listed by manufacturers as 1934, 1935 and 1936 models.

Commercial Credit Co. states that it has "no official plan for used car wholesale financing as such, but we do advance against used cars where the situation warrants."

General Motors Acceptance Corp. has no intention of establishing floor plans for dealers' used car stocks, according to an official of that corporation. Any steps that would enable dealers to carry used cars will at the same time have the effect of increasing used car stocks, a development definitely opposed to what is wanted, in the view of this official.

At the same time, G. M. A. C. has been using a low-rate used car finance plan for some time. It provides for installment payments at a monthly cost slightly in excess of the new car rate of one-half of one per cent per month, with down-payments proportionately as low as for new cars. It applies, however, only to models of the current year and the year just preceding. Like the C. I. T. plan, it runs up to 18 months.

Revelation that G. M. A. C. has no intention of floor planning dealers' used car stocks brings to light a sharp difference in theory between G. M. A. C. operations and those of other finance companies. The G. M. A. C. basis is the sale of new cars, and its plans are all directed to that end, but consider naturally the disposal of used car stocks. G. M. A. C. takes the position that dealers who tie up too much capital in used cars should not be aided to carry those cars, but to sell them. Other finance companies' plans are aimed at the financing of automobile distribution in general, on a profitable basis to the finance company.

While not advertising a "\$25-a-month plan" similar to those of other companies, G. M. A. C. has advised its dealers that it will extend any terms on both new and used cars that can be supported by the merits of the individual deal.

With adequate down payments and good credit rating, payments of \$15, \$25, \$50 or more may be arranged with G. M. A. C., provided they fit the customer's requirements.

40 Years Ago

—with the ancestors of
AUTOMOTIVE INDUSTRIES

The latest adaptation of the American motor is a 1½ hp. boat motor, which can be carried about and attached to any small boat in five minutes without marring the boat. The motor weighs 50 lb., fly-wheel included; the cylinder is 3¼ in. and the stroke, 4 in. The number of revolutions is 600. The propeller, which is at the same time a rudder, is reversible and is controlled by a lever under the steering-handle, the speed being regulated by a change in pitch of the blades. The motor is clamped on the stern in a horizontal position, and is capable of driving a boat at a speed of from six to eight miles an hour.—From *The Horseless Age*, February, 1896.

Roy Cole Becomes Chief Engineer of Studebaker

The appointment of Roy Cole as chief engineer in charge of all engineering of the Studebaker Corp. has been announced by D. G. Roos, vice-president in charge of engineering. Mr. Cole has been connected with various engineering activities of the industry for many years, and until recently was chief engineer of Dodge.

Homer Furnace & Foundry Buys Coldwater Parts Co.

The entire capital stock of the Coldwater Auto Parts Co., Coldwater, Mich., has been purchased by the Homer Furnace and Foundry Corp. in

order to facilitate the manufacture of automotive replacement parts formerly made by that company, and to increase the number of items it will be able to furnish the manufacturing and jobbing trade.

D. W. Blanc, former president of the Coldwater Auto Parts Co., has become sales manager of the automotive division of Homer Furnace and Foundry Co.

Pierce-Arrow Announces Four New Body Models

Four new body styles will be added to the Pierce-Arrow 1936 line, according to an announcement by Paul Fitzpatrick, vice-president of the company. The new models include a five-passenger convertible sedan, with folding top fitting in a well, a tonneau wind-screen (when desired), and upholstered with leather in tones to harmonize with car colors selected. This body will be mounted on 144-in. chassis in the eight and twelve-cylinder models. Other new body styles are as follows:

A special extra-large enclosed drive limousine, with large rear doors, mounted only on the 147-in. twelve-cylinder chassis.

A five-passenger club berline, with partition dividing front from rear seats and with driver's compartment upholstered in leather. This body will be mounted on the 139-in. chassis and will be available in both eight- and twelve-cylinder models.

A five-passenger formal sedan, without rear quarter windows, and with partition between rear and front seats. This body will be mounted on 139-in. chassis in both eight- and twelve-cylinder models.

An extra dividend of 25 cents and the regular quarterly dividend of 50 cents were declared this week by directors of the Timken Roller Bearing Co. An extra dividend of \$1 was paid in the preceding quarter.



General Motors' new Opel plant in Brandenburg, Germany, was officially inaugurated on Jan. 7, and is being used principally for the manufacture of trucks



European photos

Below is a corner of the assembly hall

A.F.L. Splits on Craft Union Issue

Withdrawal of United Mine Workers Weakens U. S. Organized Labor

Marking the greatest breach within the ranks of the American Federation of Labor, the smashing split over the industrial-craft union issue points to intense efforts to organize the automotive and other mass industries vertically. The encounter came to a head last Monday at the convention in Washington. It was a climax which emphasized the difference between the craft unionists and the industrial unionists.

William Green, president of the American Federation of Labor, after a prolonged address, sought to hold the United Mine Workers under the parental roof of the American Federation of Labor, committed to the craft union policy. Himself a member of the United Mine Workers Union, through which he sprung to his present eminence in the world of organized labor, Mr. Green was visibly affected as he realized his influence with his old union, even as president of its parent body, was nothing compared with the complete domination by the forceful John L. Lewis, as head of the United Mine Workers. The convention which had gone unanimously on record in favor of organizing industrial unions in mass industries was completely in the hands of Mr. Lewis.

As Mr. Green finished his impassioned plea, Mr. Lewis, undoubtedly hurt that he and his close colleague of many years standing were at the breaking point, faced the convention. No doubt, sure of his control of the situation, Mr. Lewis asked those whose attitude was unchanged by Mr. Green's speech to stand. Except for three delegates, the assemblage of 1700 rose as one man and roared applause for their president, roars that were equalled in volume only by boos which shortly before they had poured forth at the crestfallen Green, no longer respected as their chief. Their entire loyalty was given to their own president.

Thus, sketchily is seen the institution of a drive toward organizing labor in the automotive, rubber, textile, steel and other mass industries. The power that was Mr. Green's in the automotive industry, no doubt has been shaken further by the action of the United Mine Workers, itself an industrial union, the most powerful of its kind in organized labor. The authorization for its officers to withdraw from the A. F. of L., and to proceed at all costs toward industrial unionization was easily the most significant move in the ranks of organized labor since the A. F. of L. was founded in 1881. It has, of course, seen desertions before, but never one of the proportions that now not only threatens it, but seems inevitable.



Globe photo

Tanners in a Wimbledon, England, plant are working overtime to meet the demand for upholstery for British passenger cars. This is in contrast with the United States where consumption of leather by the automobile industry has been declining since 1922. In this country the use of leather in automobiles has paralleled the trend away from open cars. The largest amount ever used, according to figures of the Automobile Manufacturers Association, was 83,415,000 sq. ft. in 1922. This declined steadily until 1933 when only 6,805,000 sq. ft. of leather were used. Since then leather consumption has again been rising.

Mr. Green is expected to lose control of such organizations as the United Automobile Workers Union. His instructions, permitting the union to select its own officers, it is believed here, may mean nothing. Instead, there is a belief that the workers, already turning toward Mr. Lewis, will be absorbed by his committee into the industrial union movement.

The industrial unionists, however, are a long way from their goal and, if history repeats itself, will never reach it. Students of organized labor think the craft unionists, outnumbering the industrial unionists two to one, and as a group possessing much smarter leadership than the industrialist unions, will in the end continue in control of organized labor, although it is clear that organized labor ranks have been greatly weakened by the split over the issue.

Americans Are Too Price Conscious, Says Faulkner

Americans became overly price-conscious during the depression and some of our greatest department stores became essentially bargain basements. But this is not the type of thinking which made America great. We must get back to a quality standard.

On this theme Roy H. Faulkner, president of Auburn, fired an audience of about a thousand with the gospel of "Selling America," at a weekly luncheon meeting of the Penn Athletic Club in Philadelphia on Feb. 6.

America is still the land of opportunity, Mr. Faulkner said, but it may be necessary for us to go out and meet

opportunity half way, whereas in 1929 it came and sat on the doorstep.

He pointed out that during the depression years men bought \$15 razors in increasing thousands, which would be the equivalent of their buying shoes at \$25 a pair, and automobiles in the \$3,000 class—but nobody had the nerve to go out and sell the shoes and the cars.

World Ford Sales Were 1,311,927 Last Year

World sales of Ford units in 1935 reached a total of 1,311,927, it was announced this week by the home office of the Ford Motor Co. in Detroit. This compares with sales of 865,101 in 1934, a gain in 1935 of 446,826 units, or more than 51.6 per cent.

Ford sales during the past two years were as follows:

	1935	1934
United States	1,065,002	677,179
Canada	31,620	19,222
Balance of world	215,305	168,700
Total	1,311,927	865,101

Sales of Ford V-8 cars to the public in the United States were 1,065,002 last year, compared with 677,179 the year before, a gain of more than 55.7 per cent.

Domestic Ford sales were:

	1935	1934
Passenger cars	861,645	538,710
Commercial cars	90,099	55,090
Trucks	113,258	83,379
Total	1,065,002	677,179

Ford V-8 sales in the United States represented approximately 31.1 per cent of sales of the entire industry, thus giving Ford the leading place for 1935.

Akron "Sit-Down" Strikes Settled

*Firestone's Idleness Ends
By Arbitration, Goodyear's
After Men Get Ultimatum*

Full operations in the Akron factories of the Firestone Tire and Rubber Co. and Goodyear Tire and Rubber Co. were resumed the first week in February, following "sit-down" strikes of employees in the Firestone tire building departments of plant number one, and in the Goodyear pits, which temporarily paralyzed numerous other departments and affected hundreds of non-involved employees. Both strikes were abruptly terminated, the Firestone strike through arbitration between the management and the local rubberworkers' union, and the Goodyear strike through a stern company ultimatum giving the employees 15 minutes to resume work or else lose their jobs.

The strikes were unique and without precedent in the history of the tire industry. In neither instance did the employees walk out. Instead they remained at their posts, reading newspapers, chatting in groups and playing on improvised checkerboards, using pop bottle caps as checker men. Many of the men remained at their idle machines all night as well as during their regular shift hours.

The first "sit-down" strike of 800 in the truck tire building department of Firestone plant number one came in protest over action of the management in dismissing Clayton Dicks, a union employee, following an alleged altercation with a non-union employee whom union workers claimed the company had installed in the department as a pace maker to speed up operations.

After three days of idleness, during which hundreds of other employees were also kept from working, the men resumed work following an agreement between the management and the union. The company gave each striking employee three hours pay for every six-hour shift he was idle, and also paid non-involved employees who were kept idle in other departments.

"Interference with employees while at their work and attempts to intimidate them concerning the amount of their production was the only issue involved during the recent interruption at plant one. It was upon this charge that the employee involved was suspended. With the understanding of the committee representing him, that there would be a cessation of such practice, the company accepted it as a settlement of the issue," stated Firestone officials.

The Goodyear pit workers "sit-down" strike came in protest over a 10 per cent wage cut, more than 100 pit men joining the passive resistance. Goodyear officials refused demands to reinstate the wage cut and on Monday, Feb. 3, issued their ultimatum, giving

the striking men 15 minutes to resume work or "clear out." They went to work immediately. Goodyear officials claim that even after the wage reduction the men are getting \$1.22 per hour.

All Rubber Consumption Records Broken in 1935

Consumption of crude rubber by manufacturers in the United States for the year 1935 was the highest on record, according to statistics released by the Rubber Manufacturers Association. The amount consumed was approximately 497,150 long tons, which compares with 453,223 long tons consumed during

1934 and 401,000 long tons in 1933. The previous record established was in 1929 when 467,400 long tons were consumed.

December consumption is estimated at 42,942 long tons, which is an all time high for this month, and compares with 42,778 long tons for November, 1935, and 36,569 long tons for December, 1934.

Imports of crude rubber for the year 1935 were 448,116 long tons against 469,484 long tons imported during 1934 and 411,615 long tons during 1933. December, 1935, imports of crude rubber amounted to 34,596 long tons as compared with 28,826 long tons for November and 29,200 long tons for December, 1934.

Business in Brief

Written by the Guaranty Trust Co., New York, exclusively for AUTOMOTIVE INDUSTRIES

Farm Income 9% Higher

Farmers' cash income from sales of farm products, plus rental and benefit payments, in 1935, according to the estimates of the Department of Agriculture, amounted to \$6,932,000,000, as against \$6,387,000,000 in 1934 and \$4,328,000,000 in 1932, which was the low year of the depression. Income from marketings was higher in every month except July in 1935 than in 1934, but the greatest increase occurred in the last three months.

Crude Oil Output Slightly Lower

Average daily crude oil production for the week ended Jan. 25 was 2,820,500 bbl., showing a decline of 13,100 bbl. from the output for the preceding week. The current average is, however, above the 2,559,200 bbl. calculated by the Department of the Interior to be the total permitted under restrictions imposed by the various oil-producing States for January.

Fisher's Index

Professor Fisher's index of wholesale commodity prices last week stands at 84, as against 83.9 the week before, 83.8 two weeks before, 84.4 three weeks before, and 84 four weeks before. The average of two weeks ago was the lowest since the middle of August.

Federal Reserve Statement

Total Federal Reserve bank credit outstanding declined \$7,000,000 during the week ended Jan. 29, despite an increase of \$1,000,000 in bills discounted. The monetary gold stock rose \$7,000,000, while money in circulation declined \$11,000,000. Member bank reserve balances increased \$61,000,000.

Recessions were reported in the rates of operations in some industries last week, due in part to severe weather over large areas. Gains continued to be reported in wholesale and retail trade. Signs of pronounced revival appeared in the construction industry.

Carloadings Continue Down Trend

The movement of railway freight declined during the week ended Jan. 25. Loadings in that period totaled 584,691 cars, showing a decrease of 26,717 cars, or 4.4 per cent, from the total for the preceding week, but an increase of 29,163 cars, or 5.2 per cent above that for the corresponding period last year and a gain of 21,591 cars, or 3.8 per cent above that for the similar period two years ago.

Electric Production Rises

Production of electricity by the electric light and power industry increased during the week ended Jan. 25. Output for that period showed a gain of 9.8 per cent over the total for the corresponding week last year. During the preceding week, an increase of 9.6 per cent over last year's comparable figure was reported.

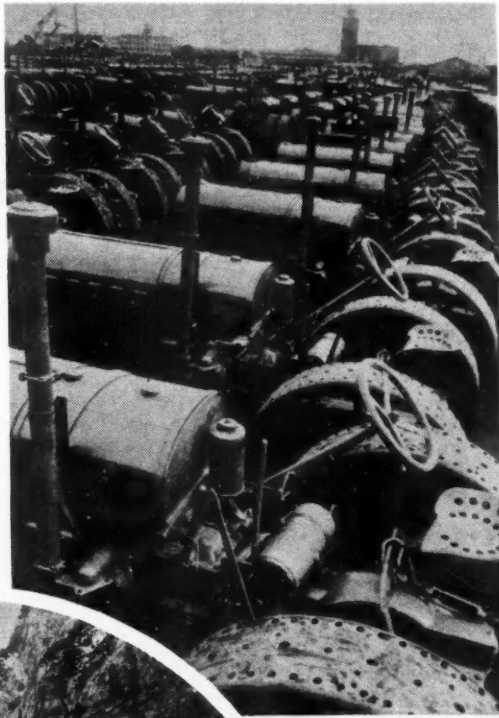
Lumber Output 56% Higher

New business booked at the lumber mills during the week ended Jan. 18 was heavier than for any previous week since last April, while production was less than in any other week, except holiday weeks, since last June, and shipments from the mills were larger than in any of the preceding six weeks. A comparison with figures for a year ago shows increases of 56 per cent in production, 38 per cent in new business, and 20 per cent in shipments.

The WORLD

(Right) Some of the 40,000 tractors built every year in the Ordonikidze Tractor Works at Khar'kov, Russia

(Below) The 30 contesting cars lined up in Yosemite Park for the Gilmore-Yosemite economy run



on WHEELS

(Below) English schoolboys examine what is said to be the world's smallest working motor car, exhibited at the Imperial Institute, South Kensington



(Above) Lubricating oil for the "Queen Mary" will be carried to the Clyde in a fleet of 14-ton tank trucks.

(Left) The first of London's new electric trolley buses, which will go into service this month, standing beside tramcar it will replace.

European, Keystone, Sovfoto and Underwood and Underwood photos

Automotive Industries

February 8, 1936

Low Priced Cars Other Than "Big 3" Had Biggest '35 Registration Gains

U. S. New Car Registrations and Estimated Dollar Volume by
Retail Price Classes—Twelve Months

UNITS				ESTIMATED DOLLAR VOLUME*						
	1935	1934	Per Cent Change	Per Cent of Total		1935	1934	Per Cent Change	Per Cent of Total	
				1935	1934				1935	1934
Chevrolet, Ford and Plymouth.	1,866,202	1,368,099	+ 36.3	68.05	72.44	\$1,137,600,000	\$827,500,000	+ 37.1	60.04	63.68
Others under \$750.	392,571	80,384	+391.0	14.32	4.26	279,800,000	54,000,000	+418.0	14.77	4.16
\$751-\$1000	369,698	359,170	+ 3.0	13.48	19.02	313,200,000	286,600,000	+ 9.1	16.53	22.06
\$1001-\$1500	92,400	52,278	+ 77.0	3.37	2.77	107,200,000	63,900,000	+ 68.0	5.66	4.92
\$1501-\$2000	7,479	13,427	- 44.4	.27	.71	12,700,000	24,200,000	- 47.5	.67	1.86
\$2001-\$3000	9,277	10,913	- 15.1	.34	.58	25,300,000	27,800,000	- 9.0	1.34	2.14
\$3001 and over	4,619	4,087	+ 13.0	.17	.22	18,800,000	15,400,000	+ 22.0	.99	1.18
Total	2,742,246	1,888,358	+ 45.2	100.00	100.00	\$1,894,600,000	\$1,299,400,000	+ 45.8	100.00	100.00
Miscellaneous	1,662	199								
Total	2,743,908	1,888,557								

U. S. New Car Registrations and Estimated Dollar Volume by
Retail Price Classes—December

UNITS				ESTIMATED DOLLAR VOLUME*						
	1935	1934	Per Cent Change	Per Cent of Total		1935	1934	Per Cent Change	Per Cent of Total	
				1935	1934				1935	1934
Chevrolet, Ford and Plymouth....	150,910	51,868	+191.0	63.63	68.72	\$89,900,000	\$27,900,000	+221.1	54.63	58.62
Others under \$750.	36,999	3,128	+1082.8	15.60	4.14	26,600,000	1,800,000	+1379.0	16.16	3.78
\$751-\$1000.....	36,073	16,888	+113.2	15.21	22.37	30,400,000	12,400,000	+145.1	18.47	26.05
\$1001-\$1500.....	11,014	2,109	+424.0	4.64	2.79	12,400,000	2,300,000	+439.0	7.53	4.83
\$1501-\$2000.....	972	553	+ 76.0	.41	.73	1,700,000	800,000	+112.3	1.03	1.68
\$2001-\$3000.....	725	617	+ 17.6	.31	.82	1,900,000	1,400,000	+ 35.6	1.15	2.94
\$3001 and over.....	468	327	+ 43.1	.20	.43	1,700,000	1,000,000	+ 70.0	1.03	2.10
Total.....	237,161	75,490	+214.2	100.00	100.00	\$164,600,000	\$47,600,000	+245.8	100.00	100.00
Miscellaneous.....	33	24								
Total.....	237,194	75,514								

* All calculations are based on list price F.O.B. factory of the five-passenger, four-door sedan in conjunction with actual new car registrations of each model. The total dollar volumes for the different models are then consolidated by price classes.

ASI Show Dates Set for Week of Dec. 7-11

(Continued from page 167)

new all-time high and well on the way to the 600 mark.

3. Approval of the testing out, in one or more manufacturers' product groups, of a plan aimed at standardization of quality in parts and incorporating the use of a mark of approval on merchandise meeting the specified standards.

4. Issuance to manufacturers, by N.S.P.A. Wholesalers' Board of Governors, of a resolution calling attention to the necessity of some provision being made in order that wholesalers may meet the demands of the social security taxes, first payment on which is due next January.

While not unexpected, it should also be reported that the N.S.P.A. board to which, at the association Atlantic City convention, authority had been delegated to decide as to the type, time and place of the 1936 show, went on record

as in favor of another jointly sponsored exhibition for which tentative plans were signed by presidents of N.S.P.A. and M.E.M.A. at Atlantic City.

Price Rise Likely On Machine Tools

(Continued from page 167)

cent higher than 1934. Wages, taxes and material costs have all increased and the upward trend is continuing. The cost of the social security act will fall heavily on the machine tool trade because of the relatively high labor costs involved.

Price advances made during the past 12 months have mostly been on base prices. The changes contemplated now would be in list prices.

Manufacturers have not yet decided on the extent of price advances, but such tools as lathes, drilling and boring machines appear certain of some advances soon.

The National Machine Tool Asso-

ciation reports demand for tools continuing good with some deliveries delayed because of a scarcity of skilled labor. Deliveries are now being reported later than they were a year ago. January business is as good as December for most plants, with some showing an increase.

Automobile manufacturers are reported accounting for most of the business now being placed for the next eight to ten months, though all producers have not yet specified needs for the coming year's models. Sales of can-making machines at the canners' convention in Chicago last week set a new record. Inquiries from railroad sources are increasing, but are still relatively light.

James E. De Long Becomes Waukesha General Manager

James E. De Long, executive vice-president of Waukesha Motor Co., has been appointed general manager. Mr. De Long has been connected with the company for 13 years, having joined the organization in 1923 as field engineer in charge of oil industry operations.

He will also continue as head of the executive board, established in 1928 by the late Harry L. Horning. Other members of the board include J. B. Fisher, chief engineer; C. P. Ross, assistant secretary and treasurer; J. G. Swain, sales manager; and A. S. Cronk, director of purchases. Originally established as part of Waukesha Motor Co.'s

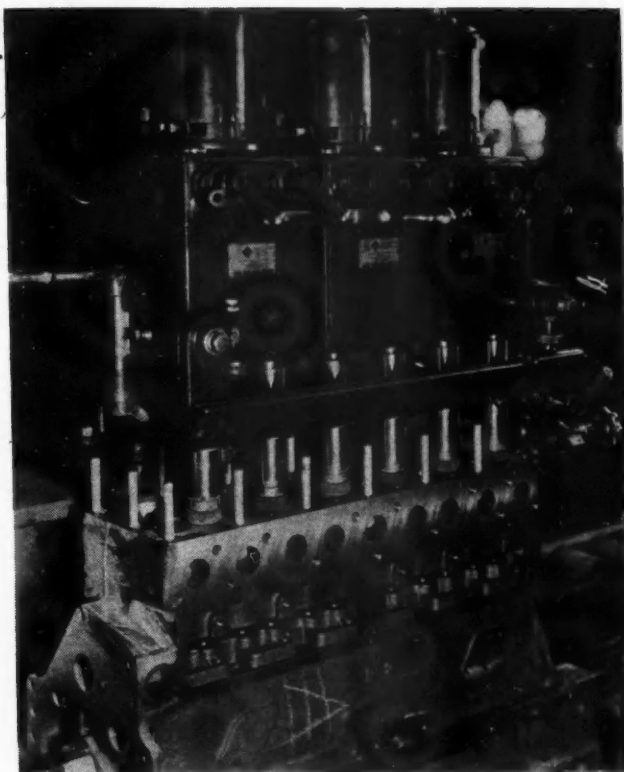
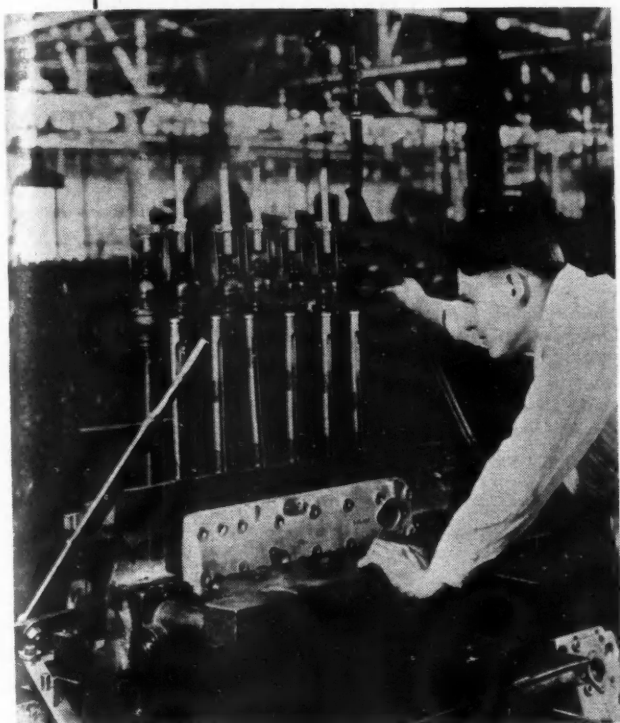


James E. DeLong
who was recently appointed general manager of the Waukesha Motor Co.

broad organization program, this board continues to function in the capacity of a supervisory committee on all productive and marketing operations. All members are on the board of directors.

The Illinois Automotive Parts Association scheduled to hold its five-day meeting at Navy Pier beginning on April 4, has notified the trade that all available display space at its annual show has been taken. More than 160 exhibitors have contracted for 400 booths, and there will be 43 exhibitors of machine shop equipment.

(Below)—Exacting care is taken to insure the accuracy of combustion chambers in Graham high-compression cylinder heads. This machine limits the volume variation between the combustion chambers of a cylinder head to two cu. cm.—about the equivalent of a half-teaspoon measure



(Above)—The first self-contained, automatic, six-spindle valve seat grinding machine developed by Hall Manufacturing Co. for Plymouth Motors has been installed. This machine was placed on the engine line a week ago and probably will be supplemented by an additional machine to handle the entire production. The machine will finish hard valve seats at the rate of about 90 blocks per hour

Sales Heads Plan for March Upturn

(Continued from page 167)

manufacturers to balance production against sales at this time of the year when dealer inventories should be building up in preparation for the spring selling season which now looms on the horizon. But with the heavy load of used cars being carried, dealers are not in position to take more cars than their near future requirements call for, nor are the manufacturers disposed to glut the dealers.

Hence factories are adhering to the sound policy of an orderly accumulation of cars in the selling field, and are ready to slow down promptly their assembly lines when the ratio between production and sales is disturbed by a drop in consumer demand. March 1, regarded as the opening of the spring season, therefore will find dealers adequately stocked but not overloaded with new cars.

Sales executives are sticking to their predictions of a sharp rebound in retail sales and a "tremendous business" in the spring. It is history in the industry

that where sales held firm through the late fall months the following spring brought decided revival of buying. New models alone were not responsible for the record volume of last November and December. An important factor was the rising tide of replacement demand that has receded only temporarily and is confidently expected to be back in full force this spring.

As a matter of fact, the most recent retail delivery figures reported to the factories are far from discouraging. In some instances gains were shown over the earlier reporting period, but to some extent the figures represent deliveries against orders taken earlier, so that the full effect of the bad weather is not reflected, but will be spread over reports covering the first week or ten days of February.

Studebaker

Paul G. Hoffman, president of the Studebaker Corp., reports an increase of 43 per cent in retail deliveries of Studebaker cars and trucks during the first twenty days of 1936 compared with the same period in 1935. The figures are 1650 units last year and 2353 units this year.

Graham

Retail sales of Graham cars for the second ten day period in January exceed the first ten days by 52 per cent and the same period last year by 131 per cent, according to

Robert C. Graham, executive vice-president. "Orders on hand for the new Graham Super-charger now represent nearly 40 per cent of our total business, and exceed the total output of this model in 1935," Mr. Graham stated.

Hudson-Terraplane

Sales of Hudsons and Terraplanes are 46 per cent ahead of this time a year ago, according to W. R. Tracy, vice-president in charge of sales of Hudson Motor Car Co., who estimated over 6000 of the new models would be sold by the end of January, a figure not exceeded since 1930. "Our sales are again turning upward," states Mr. Tracy. "The figures for the second half of January will be well over those for the first half when the final returns are in."

Vincent Bendix Becomes Legion of Honor Knight

Vincent Bendix, president of the Bendix Aviation Corp., has been made a Knight of the Legion of Honor by the French Government. The presentation was made by M. René Weiller, Consul General of France, at a party given for Mr. Bendix in Chicago. The decoration was given in recognition of Mr. Bendix's efforts in organizing a South Bend branch of the Alliance Française and for his interest in the social and economic relations of the employees of the Paris plant of the Bendix Aviation Corp.

Packard, DeSoto, LaSalle Led Registration Gains in 1935

Complete 1935 New Car Registrations

	December 1935	November 1935	December 1934	Twelve Months		Per Cent Change 12 Mos., 1935 over 1934	Numerical Change 12 Mos., 1935 over 1934	Per Cent of Total Twelve Months	
				1935	1934			1935	1934
Ford	54,594	56,578	14,209	826,519	530,528	+ 55.8	295,991	30.12	28.09
Chevrolet	63,785	57,379	25,756	656,698	534,906	+ 22.8	121,792	23.93	28.32
Plymouth	32,531	30,321	11,903	382,985	302,557	+ 26.6	80,428	13.96	16.02
Dodge	16,979	15,897	3,968	178,770	90,139	+ 98.3	88,631	6.52	4.77
Oldsmobile	14,212	13,356	2,146	149,375	71,676	+108.4	77,699	5.44	3.80
Pontiac	11,011	11,409	2,144	140,122	72,645	+ 92.9	67,477	5.11	3.85
Buick	12,291	12,612	3,857	87,635	63,067	+ 39.0	24,568	3.19	3.34
Terraplane	6,037	3,962	1,850	53,838	40,510	+ 32.9	13,328	1.96	2.15
Chrysler	3,552	1,128	1,348	40,536	28,052	+ 44.5	12,454	1.48	1.49
Studebaker	3,998	1,968	2,113	39,573	41,560	- 4.8	-1,987	1.44	2.20
Packard	4,160	4,493	481	37,653	6,552	+474.6	31,101	1.37	.35
De Soto	2,409	1,350	484	26,952	11,447	+135.5	15,505	.98	.61
Hudson	2,309	1,859	902	21,587	19,307	+ 11.8	2,280	.79	1.02
Nash	1,903	1,133	663	17,739	14,315	+ 23.9	3,424	.65	.76
La Fayette	1,203	1,035	712	17,445	9,301	+ 87.6	8,144	.64	.49
Graham	1,075	757	612	15,965	12,887	+ 23.9	3,078	.58	.68
La Salle	1,019	1,173	279	11,775	5,182	+127.2	6,593	.43	.27
Willys	1,074	1,137	253	10,439	6,576	+ 58.7	3,863	.38	.35
Hupmobile	484	359	640	7,450	6,566	+ 13.5	884	.27	.35
Cadillac	1,130	1,055	259	6,692	4,899	+ 36.6	1,793	.24	.26
Auburn	245	263	383	5,163	5,536	- 6.7	-373	.19	.29
Reo	289	233	234	3,894	3,854	+ 1.0	40	.14	.20
Lincoln	792	180	97	2,370	2,061	+ 15.0	309	.09	.11
Pierce-Arrow	79	73	99	875	1,740	-49.7	-865	.03	.09
Miscellaneous	33	552	122	1,868	2,694	-31.0	-836	.07	.14
Total	237,194	220,262	75,514	2,743,908	1,888,557	+ 45.3	855,351	100.00	100.00
Chrysler Corp.	55,471	48,696	17,703	629,243	432,195	+ 45.6	197,048	22.93	22.89
Ford and Lincoln	55,386	56,758	14,306	828,889	532,589	+ 55.6	296,300	30.21	28.20
General Motors	103,448	96,984	34,441	1,052,297	752,375	+ 39.9	299,922	38.35	39.84
All Others	22,889	17,824	9,064	233,479	171,398	+ 36.2	62,081	8.51	9.07

Complete 1935 New Truck Registrations

	December 1935	November 1935	December 1934	Twelve Months		Per Cent Change 12 Mos., 1935 over 1934	Numerical Change 12 Mos., 1935 over 1934	Per Cent of Total Twelve Months	
				1935	1934			1935	1934
Ford	13,764	14,191	6,346	185,848	128,250	+ 44.9	57,598	36.40	31.75
Chevrolet	12,475	10,875	7,919	167,129	157,507	+ 6.1	9,622	32.73	39.00
Dodge	4,634	4,642	4,656	61,488	48,252	+ 27.4	13,236	12.04	11.95
International	4,052	4,136	2,508	53,471	31,555	+ 69.5	21,916	10.47	7.81
G. M. C.	1,344	783	754	11,442	10,449	+ 9.5	993	2.24	2.59
Diamond T.	513	378	365	6,454	5,440	+ 18.6	1,014	1.26	1.35
Reo	551	273	356	5,101	5,035	+ 1.3	66	1.00	1.25
White	370	334	253	3,304	3,963	- 16.6	-659	.65	.98
Willys-Overland	197	202	1	2,280	25		2,255	.45
Federal	203	227	139	2,190	1,962	+ 11.6	228	.43	.49
Studebaker	99	137	125	2,100	1,697	+ 23.7	403	.41	.42
Mack	141	137	98	1,515	1,890	- 17.2	-375	.30	.45
Breckway	111	116	70	1,245	1,213	+ 2.6	32	.24	.30
Autocar	157	89	77	1,001	1,139	- 12.1	-138	.20	.28
Stewart	99	91	42	880	736	+ 19.5	144	.17	.18
Indiana	132	102	30	862	729	+ 18.2	133	.17	.18
Plymouth	120	35	6	660	123	+436.5	537	.13	.03
Terraplane	16	13	38	638	517	+ 23.4	121	.12	.13
Divee	86	23	25	398	254	+ 56.6	144	.08	.06
Henney			24	323	271	+ 19.2	52	.06	.07
F. W. D.	21	26	12	212	156	+ 35.8	56	.04	.04
Austin	6	5	44	181	494	- 63.4	-313	.03	.12
Sterling	17	17	19	174	134	+ 29.8	40	.03	.03
Sayers & Scoville			17	137	147	- 6.8	-10	.03	.04
Twin Coach	6	6	10	136	196	- 30.6	-60	.03	.05
Meteor			11	122	178	- 31.5	-56	.02	.04
Buick	3	4	16	116	152	- 23.7	-36	.02	.04
Miscellaneous	141	93	109	1,276	1,482	- 13.9	-206	.25	.37
Total	39,258	36,935	24,070	510,683	403,886	+ 26.4	106,797	100.00	100.00

Canadian New Car Financing Almost Doubled Last Year

Financing of sales of new and used automobiles in Canada last December showed sharp advances over the corresponding month in 1934. A gain of 203.6 per cent was recorded in the number of new vehicles financed, while

a gain of 181.8 per cent was shown in the dollar volume of financing. Used cars showed gains of 51.6 per cent in number and 56.0 per cent in dollar volume.

The number of cars, trucks and buses financed was 5206, of which 1864 were new vehicles and 3342 were used vehicles. The dollar volume of financ-

ing in December was \$2,227,680, compared with \$2,293,405 in November, and \$1,059,993 in December, 1934.

There were 100,178 vehicles financed to the extent of \$40,342,264 during 1935, compared with 76,170, at \$30,091,463, in 1934 and 54,238, at \$20,158,788, in 1933. New cars, trucks and buses financed numbered 31,950 at \$22,410,656 and used vehicles 68,228 at \$17,931,608.

Backlog of Steel Orders Shrinking

Automotive Flat Steels Are Still the Mainstay of Industry's Activities

The steel market continues to cling to the hope that fresh buying by automotive consumers will before long replenish the dwindling backlogs of rolling mills. Meanwhile mills maintain a fairly high operating rate, with their unfilled tonnage shrinking more and more. While one or two of the finishing plants in the Detroit area continue to operate at or near the top rate, others have pruned their output by approximately 15 per cent. Cleveland district and Mahoning Valley mills are also working at an easier pace. On the whole, however, in spite of the lessened pressure, shipments of flat steels into automotive consumption continue to overshadow in importance all other of the steels industry's activities.

There is much talk of a revival of buying of heavy steel products, such as rails, to make up for the temporary lull in automotive demand, but rails are in a class by themselves and are rolled in mills that otherwise stand idle, so that their being in operation does not take up the slack in the regular products. Moreover, in the past rail business has frequently been used as a sort of window dressing when the market needed a tonic. Cold rolled strip, a typical automotive material, comes in for outstanding attention even during the present lull, mills receiving odds and ends of specifications that in the aggregate make up quite a tonnage.

The price situation shows virtually no change, previously reported concessions having become general. No announcement has been made with reference to the \$2 per ton advance in sheet bar prices and which, because of sheet prices tending in the opposite direction, has become inoperative, non-integrated rolling mills simply having placed no business at the higher levels.

Pig Iron—Weather conditions and lack of incentive to anticipate second quarter requirements have combined to put a crimp in the movement of iron to automotive foundries as well as into fresh commitments. The market's price structure remains the same.

Aluminum—The undertone of the market for secondary aluminum is a shade easier, scrap prices having given way fractionally. Routine conditions prevail in the market for primary metal.

Copper—While Standard Statistics emphasizes the possibility of an advance in



Rudolph Caracciola,

one of the foremost European automobile race drivers, arrived in New York last week. He intends visiting automobile speed-ways in the United States.

the near future to 9½ cents for electrolytic, the market so far gives little indication of an immediate change. Revised figures of January sales show that bookings were approximately 33,000 tons, with the exception of November, the low since last Summer's dullness. The market continues unchanged at 9½ cents, delivered Connecticut point.

Tin—A revival of speculative activities on the London Metal Exchange together with the upward movement in the quotation for Sterling exchange in terms of the dollar caused wide swings in the market in the last few days. For a long range view a statement made in London by John Howeson, chairman of the Nigerian Tin Mines, to the effect that the tin mines with their existing equipment could produce 230,000 tons a year, while consumption could not be expected to exceed 160,000 tons a year in the next two years, is of greatest importance. Continued control, said Howeson, was, therefore, essential. Spot Straits tin was held at 48½ cents at the beginning of this week.

Lead—Firm amid good demand.
Zinc—Steady.

General Motors Plants Set Safety Record Last Year

The 72 plants of General Motors in the United States and Canada established an all-time safety mark for the corporation in 1935, General Motors officials announced.

Working more than 331,000,000 hours last year, these plants reduced the number of accidents by 24 per cent; cut the frequency of lost time accidents per million hours worked by 38 per cent and the severity (the number of days lost per thousand hours worked) by 35 per cent, compared to 1934. This improvement was made despite the fact that hours worked last year were 21 per cent higher than 1934.

Describing safe working conditions as a "primary responsibility of management," C. E. Wilson, vice-president of General Motors, said that the improvement last year resulted from the continuous cooperation of men and management in plant operations.

"Safe working conditions are a primary responsibility of management," Mr. Wilson said. "On a visit to 27 plants last year, I found management genuinely interested in safety. Contests between plants or de-

partments served to spur interest in safety and keep it uppermost in the minds of the entire organization. To show how effective our safety program was in 1935, workmen in our plants lost 67,754 fewer days of work due to accidents than they did in 1934. We expect to better our accident experience even more in the future by continued vigilance."

Republic Steel to Spend Million for Improvements

Directors of Republic Steel Corp. this week voted \$1,200,000 for immediate capital improvements. A sum of \$500,000 will be spent at Warren, Ohio, to remodel and improve the cold rolling department for strip steel, and to install additional finishing equipment to increase tin-plate production at Warren. More than \$250,000 will be spent in improving the electric weld tube mill at Youngstown, with \$150,000 for improving other Youngstown plants. A smaller sum will be spent in improvement of Cleveland plants. The \$45,000,000 refunding loan for Republic Steel was offered during the week by Kuhn, Loeb & Co. and Field, Gloré & Co. The bonds were reported favorably received.

American Felt Co. Enlarges Plant and Adds to Personnel

The American Felt Co., of New York, is enlarging its personnel and increasing the facilities of its cutting factory at Detroit to take care of increased demand. The Detroit factory is now supplemented by a new large cutting plant at Port Chester, N. Y.

The Transue Williams Steel Forgings Corp. this week reported that 1935 was its best year since the beginning of the depression. It reported a net profit of \$55,350 in production of automotive parts.

Chrysler Employees Will Share \$2,300,000 Bonus

The Chrysler Corp. has announced a special distribution of \$2,300,000, appropriated from earnings, to be paid to employees who were on the payrolls during any part of the first three months of 1935. Distributions will be shared by employees of the Canadian, English and Belgian Chrysler companies. About 59,000 will share in the bonus, of whom 54,000 live in the Detroit area.

In making the announcement, Walter P. Chrysler, chairman, and K. T. Keller, president, stated that the minimum payment to any eligible employee will be \$30, with \$2 additional for each year of service up to 10 years. Payments will be made Feb. 14. Mr. Chrysler said in connection with the announcement that he wished to thank each employee for valuable services rendered and that he was happy that the company is in a position to pay the additional compensation.

At the same time, Mr. Chrysler and Mr. Keller hinted that some plan is in the making for the further stabilization of employment in automobile manufacture from year to year. They said it is their hope that further progress along that line can be made, "notwithstanding the practical difficulties due to wide fluctuations in the demand for automobiles, not only at different times of the year, but also from one year to another."

Fruehauf Trailer Gives Account to N. W. Ayer

Leslie C. Allman, advertising and sales promotion manager of the Fruehauf Trailer Co., Detroit, Mich., announces the appointment of N. W. Ayer & Son, Inc., to handle the Fruehauf advertising.

CALENDAR OF COMING EVENTS

SHOWS

Amsterdam, Netherlands, Automobile Show	Jan. 31-Feb. 9
Germany, Automobile Salon, Berlin,	Feb. 15-March 1
Finland, Automobile Show, Helsinki	Feb. 25-March 1
Austria, Automobile Show, Vienna,	March 8-15
Switzerland, Automobile Show, Geneva,	March 20-29
Hungary, Automobile Show, Budapest,	Mar.-April
Illinois Automotive Parts Assoc., Maintenance Exhibit, Navy Pier, Chicago,	April 4-8
Portugal, Automobile Show, Lisbon,	begins April 16
Yugoslavia, Automobile Show, Zagreb,	May 2-11
Spain, Automobile Show, Madrid,	May 10-20
Morocco, Fair of Tangiers,	May 16-24
Yugoslavia, 16th International Spring Fair, Lubiana,	May 30-June 11

France, Automobile Exhibit at Foire de Paris	May
Norway, Automobile Show, Oslo,	May

CONVENTIONS AND MEETINGS

Assn. Highway Officials of No. Atlantic States, Atlantic City,	Feb. 12-14
American Society for Testing Materials, Regional Meeting, Pittsburgh,	March 4
S.A.E. Tractor and Industrial Power Meeting, Milwaukee, Wis.,	April 15-16
American Gear Manufacturers Association, Twentieth Annual Convention, Philadelphia,	April 20-21
S.A.E. Production Meeting, Detroit, Mich.,	April 21-24
U. S. Chamber of Commerce, Annual Meeting, Washington,	April 27-30
American Petroleum Institute Mid-Year Meeting, Tulsa, Okla.,	May 13-15
S.A.E. Summer Meeting, White Sulphur Springs, W. Va.,	May 31-June 6
American Society for Testing Materials, Annual Meeting, Atlantic City,	June 29-July 3
American Society for Metals, 18th Nat'l Congress, Cleveland, O.,	Oct. 19-23

Automotive Developments



(Circle) One-cylinder child's car built by the Gorki plant



(Below) Moscow school children in cars they built themselves.

Sovfotos

(Right) A pylon at the Moscow motor car show illustrates the progress of the Stalin auto plant since 1928. The figures under the model plates show the output and the number of workers employed. The top figures represent the goal set for 1937.

SINCE the U. S. S. R. began to manufacture its own automobiles, its imports have decreased year after year, while domestic production was increasing. In 1930, the number of vehicles imported was 6671; in 1931, 2892; in 1932, 2231; in 1933, 448, and in 1934, 428.

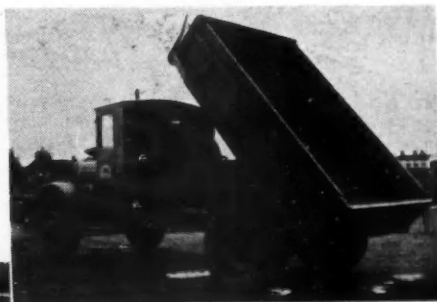
Imports of automobile parts and accessories have decreased still more. The principal suppliers of the Soviet market at the present are, in the order named: the United States, England, Austria, Germany and Italy. The last two for a time exported large quantities of automotive products to Russia, but the political breach between Fascism and Communism is apparently paralleled in the economic field, and capitalistic countries have gained the ascendancy over the Fascists.

Tractor production has increased even more rapidly than that of automobiles, and Soviet Russia claims first place for tractor output last year. The two older Soviet tractor plants are located at Stalingrad and Kharkov. The former was opened in 1930, and the latter began operations in 1932. The great Chelyabinsk Stalin tractor plant, in the Urals, was opened in June, 1933, and celebrated its second birthday by producing its 20,000th tractor, of the heaviest, crawler-type. The other two tractor plants also build crawlers, and the Kharkov works, wheel tractors as well.

Ten years ago, Soviet production of tractors in the month of December was 49—last year it was 9500 for the same month. Seven motor trucks were built in December, 1925, and last December the figure rose to 7000. Passenger car output in December, 1935, amounted to 1700, and ten years ago none were being produced.



In Soviet Russia



(Top) The design of trucks has closely followed that of the U.S.A.

(Above) Group of Diesel-engined trucks in Moscow after a 3000 mile run to Tiflis.

(Left) Assembly line in the Yaroslavl truck works.

(Right) Putting the last cleats on a big crawler-type tractor in the Chelyabinsk Stalin tractor works in the Urals.

(Lower left) Parade of Soviet-built cars and trucks in Moscow celebrates the 50th anniversary of the automobile.

(Circle) Fifty of the best workers in the Kharkov tractor works have been awarded cars for their personal use.

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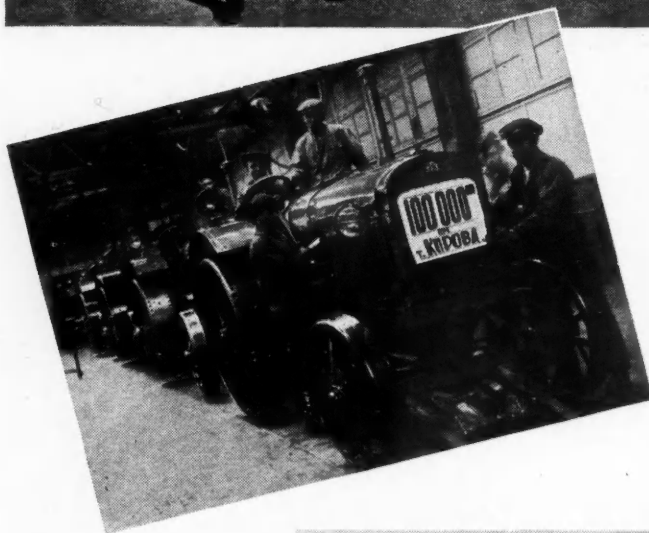
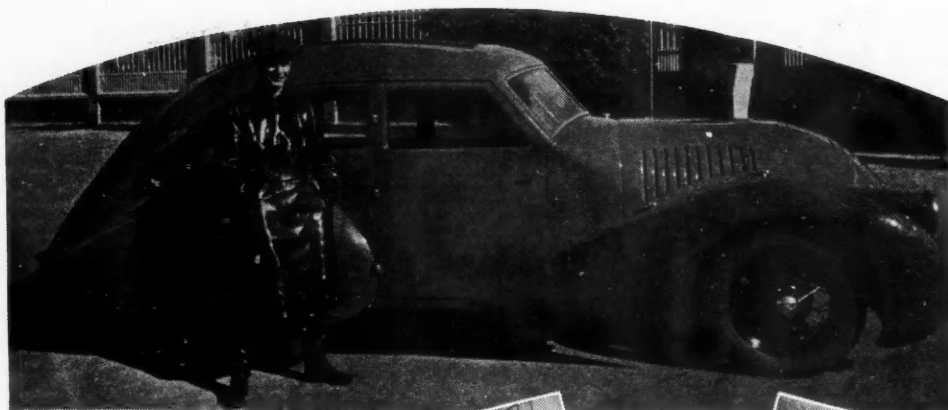


Developments In Russia

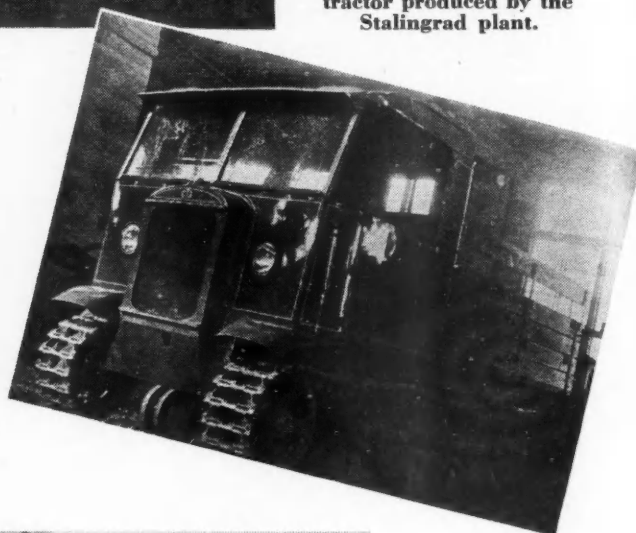
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(Left) Engineer Nitikin with his newly designed streamlined 6-pass. car.

(Below) Crawler - type tractor produced by the Stalingrad plant.



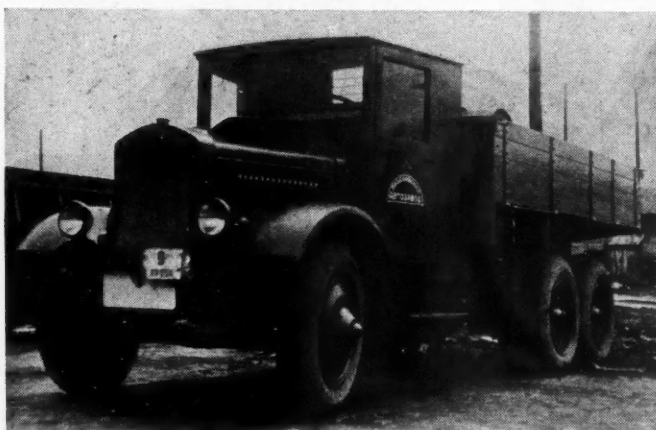
(Above) The Kharkov tractor plant completed its 100,000th tractor last April. The plant began operation in October, 1934.



(Center) Bread delivery truck used by Moscow Bakeries' Co-operative.

(Below) New model "Yagio," three - axle, eight-ton truck built at the Yaroslavl plant.

(Below) Motor bus, model "ZIS-8," made at the Stalin plant in Moscow for the City of Ankara, Turkey.



JUST AMONG OURSELVES

A Strong Pull, All Together

HERE and there in the United States are indications that used-car stocks are being liquidated with fair rapidity, in some cases by Herculean feats of selling effort. We cannot recall any time in the history of the automobile when a merchandising emergency was met with such prompt treatment by all the factories whose dealers were most concerned. Solution of the broader problem of dealers making money out of used cars seems still to await solution by a long period of educational effort, rather than by quick panaceas.

American Enterprise Comes to the Front

THE words "American Enterprise" began to be spoken around the world about the time of the Yankee clippers, as a synonym for the American quality of finding ways of getting things done—a little faster, often a little better. With the passing of a century we find now that the words have new meaning; to distinguish what remains of our industrial and economic freedom—which is great—from that which is little in those countries which have succumbed completely to dictatorship.

"Principles of American Enterprise" will be the chief topic of the twenty-fourth annual meeting of the Chamber of Commerce of the U.S.A. Every week, for so long as it seems necessary, a statement of some form of these principles will be a part of

the editorial content of AUTOMOTIVE INDUSTRIES.

There is no industry in the land which is a better example of American enterprise than the automobile industry and its allies. Divided on many fronts, the General Motors Corp. and the Ford Motor Co. find a common need for a restatement of those fundamentals which have had a large part in the creation of our past prosperity. Such a need is beyond the boundaries of partisan politics.

Two New Slants On Safety Problem

A HIGHWAY-ACCIDENT survey made on Massachusetts roads in the period from Dec. 31, 1933, to Sept. 30, 1934, as a CWA and ERA project, with the cooperation of the Massachusetts Institute of Technology, is now available as a complete text.

The Massachusetts report is particularly interesting, first as being one of the most complete ever made within a state, and second, as having had especially good technical direction.

Prof. Dean A. Fales of M.I.T. has contributed to Section 9 of the report a good analysis of the relation of the component parts of motor vehicles to safety. Other sections deal with pertinent points of highway construction, characteristics of the motor vehicle, and the psychology of drivers. There are many generalizations in the report applicable to the highway safety problem in all states.

Another report of interest to the industry has been published by the Highway Research Board, in the form of a paper on "In-

spection of Motor Vehicles," by William S. Canning, engineering director of the Keystone Automobile Club. Mr. Canning has analyzed the results of safety-lane inspections in states where they have been made. On a cold, factual basis he demonstrates once again the very small proportions of accidents which are directly traceable to defects in motor vehicles. His paper is so interesting that we hope to publish it in full in a subsequent issue.

The Driver's Voice Is Mighty Indeed

IN a brochure called "The Voice of the People," the National Highway Users Conference points out that the number of automobile drivers in the United States exceeds by 2,000,000 the number of persons who voted in the presidential election of 1932.

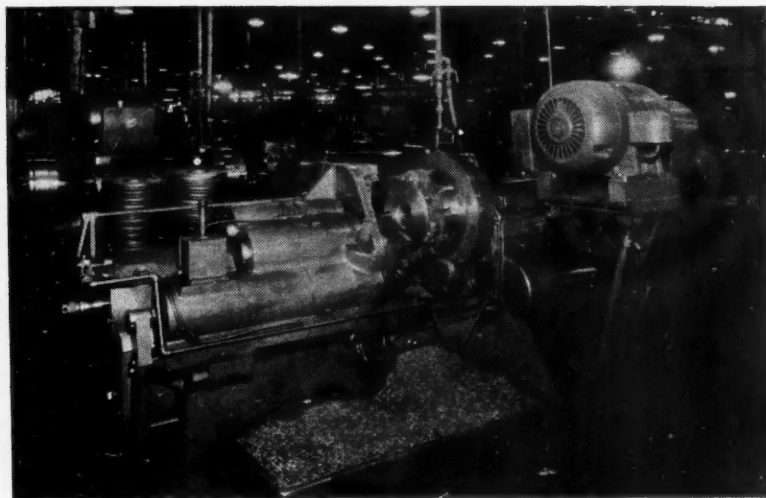
So, justly, concludes the conference, the views of this number of persons on a single subject, as expressed through the organizations representing them on automobile questions, may be called, "The Voice of the People."

In conformity with this interesting idea, the conference has collected between covers resolutions passed on the subject of motor-vehicle regulation and taxation at recent meetings of the American Automobile Association, the American Farm Bureau Federation, the National Industrial Traffic League, the National Grange, and the Farmers' Union.

It is very difficult for anyone to keep track of all that is happening in the way of motor-vehicle legislation in all the states. Such publications as the one mentioned above perform a useful function in bringing to the attention of a large number of persons a single principle, with the weight of Demos behind it. "Users of highways must be treated justly in matters of regulation and taxation."

—H. H.

Flywheels Machined In Two Operations



The first operation of the Gisholt Simplimatic on Plymouth flywheels. This is one of a battery of two machines, the second operation machine being located directly in the background

WHAT is said to be the first use of a new method of machining flywheels with great precision and at high speed is reported by the master mechanic's department of Plymouth Motor Corporation. The flywheels are of gray iron and are completely finished on a battery of two Gisholt radial slide Simplimatic lathes, tended by a single operator.

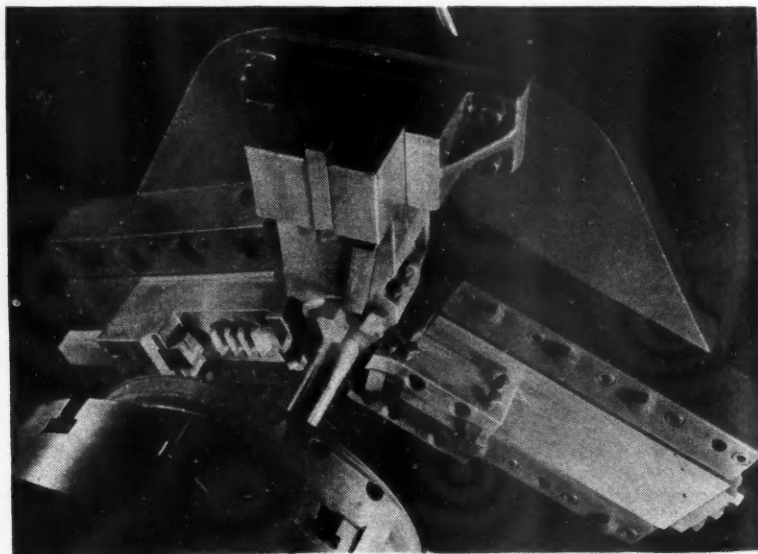
Castings are completely machined on these lathes in two operations, the first operation being the machining of the ring gear diameter and the clutch contact face, and in the second operation the balance of the outside diameters and the crankshaft side are machined.

Cutting time for the complete cycle is 1.12 min.; floor to floor time 1.35 min. or 44 per hr. at 100 per cent efficiency for each operation. One man is easily able to operate two machines, whereas formerly it was necessary for one man to operate three machines producing 18 per hr. against 44 per hr. with new method. The safety factor has also been increased, as work does not revolve until tool blocks are within $\frac{1}{4}$ in. of the cutting surface, while the starting lever is placed in such position that the operator is removed from revolving parts before machine is set in motion.

The work in each case is placed in a three-jaw air-operated chuck, squared by resting the back face on three pins in the chuck body, and clamped on the outside diameter. The master slide, carrying one front tool block, one rear tool block, and one vertical tool block, is rapid-traversed to within $\frac{1}{4}$ in. of working face by means of an air cylinder. A drum type cam then engages the master slide and carries the tools into the work to the required depth. The master slide is then in dwelling position and front and rear tool blocks are fed across face of work from back to front, by means of a rack and pinion driven by drum cam.

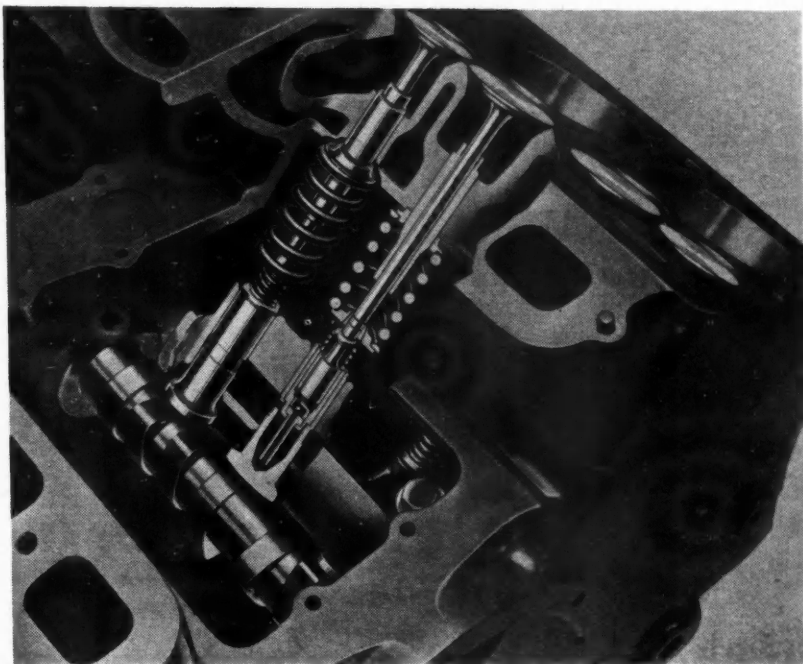
The tool blocks carry tungsten-carbide and Stellite J-metal tools and perform the roughing operations, removing $\frac{3}{32}$ in. of stock. The work for these roughing operations revolves at 48 r.p.m. while the tool blocks feed 0.025 in. per revolution.

Upon completion of the roughing cycle, the chuck automatically decreases in speed to 30 r.p.m. and the vertical tool block, equipped with shaving tools, moves into work at 0.005 in. feed per revolution for the finishing operation. Approximately $\frac{1}{32}$ in. stock is removed in finishing. At completion of cut, chuck speed increases to 48 r.p.m., drum cam returns master slide $\frac{1}{4}$ in., and the air cylinder rapid-traverses the master slide to starting position.



Packing a heap of tools for the Plymouth flywheel job. This is a close-up of the first operation on the machine illustrated here. The four tools at the left cut through the scale and take the roughing cuts across the clutch face, each tool doing one-quarter of the work. Simultaneously, the tools at the right directly at the pilot turn the pilot face. Finishing cuts are completed by massive shaving tools of which the center tool in the vertical holder takes the clutch face while the one next to the pilot finishes the pilot hole. Tools for both machines are tipped with cemented carbide and Haynes J-Metal

Fig. 1. Cut-away view showing hydraulic valve lifter arrangement on Cadillac V-8 engine. They are installed in blocks of four and require no adjustment during the life of the engine.



Cadillac Hydraulic Valve Lifter Is Self-Adjusting

AN excellent example of the "hidden" elements of design which nevertheless contribute so largely to engineering progress is found in the hydraulic valve lifter of the "zero clearance" type adopted by the Cadillac Motor Car Co. for the 1936, V-8 engines.

The use of a zero clearance valve lifter at Cadillac is a logical development dating from the company's adoption of its own patented construction incorporated in the V-16 engine some years ago.

As shown in Fig. 1, the valve lifter consists of two principal elements—an outer shell; and the hydraulic unit comprising cylinder, plunger, and ball-type check valve. These units are mounted in blocks of four, secured as shown. Self-adjustment is accomplished by supplying oil under pressure from the engine to the sump provided in the lifter bracket, through drilled holes. The bracket has two such holes: A bleed hole which allows any accumulation of air in the reservoir to escape through the lifter guide hole into the upper crankcase of the engine; and another hole, at a lower level, which feeds air-free oil to annular groove in the lifter body and into the lifter.

In a complete cycle of the cam, starting with the lifter on the base circle, the hydraulic plunger is actuated outwardly by the spring to take up any space between the end of the valve stem and the cam. As the cam revolves, the initial pressure developed seats the check ball so that oil under the plunger is trapped, and the valve is lifted on a

column of oil. During the interval when the valve is off its seat, a slight oil leakage occurs which is necessary to compensate for any expansion in the valve gear. At the point of valve closing, the chamber below the plunger is replenished with oil, thereby eliminating clearance.

According to production experience at Cadillac, the hydraulic valve lifter is responsible for the following important advantages in engine construction and performance:

1. Quietness—this was considered to be the outstanding feature in the early stages of development.

2. Self-adjustment which makes it possible to locate the valve gearing in any convenient position without considering service accessibility.

3. Because of freedom from service adjustment mentioned in (2) it is possible to arrange engine accessories over the top of the block, thus making these units ideally accessible particularly in these days of high fenders and short hood side.

4. Actual service history has proved that the zero clearance valve lifter improves valve action by preventing pounding or riding on the valve seat and reduces the need for valve grinding.

5. Valve ramp may be entirely eliminated—and is practically non-existent on the Cadillac V-8—due to the ability of the lifter to follow the cam precisely under all conditions. Variable timing due to the action of the adjustable tappet under changing engine conditions has been entirely eliminated.

6. A tangible increase in engine horsepower, at least in the top range, has been experienced due to the elimination of valve cam ramp. On the Cadillac V-8 this has increased the valve opening cycle by 28 deg., thus materially increasing the area under the valve-lift diagram.

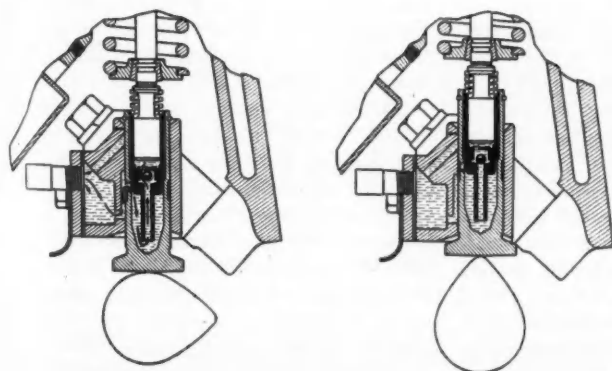
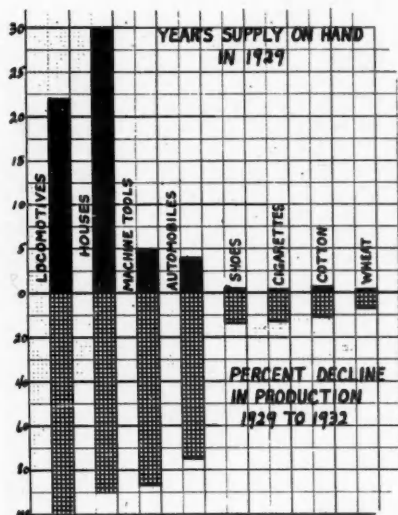


Fig. 2. Showing relative position of valve lifter components during situations where valve is wide open (left) and fully closed (right). Section at the left indicates path of the crankcase oil—air-free oil moves downward and into the valve lifter body, while air bubbles entrapped in oil may pass freely through the diagonal vent which runs back into the crankcase.

Behavior of the Automobile



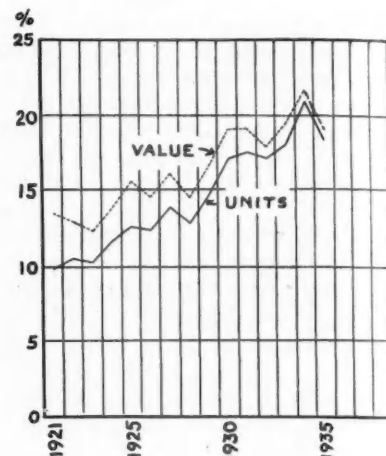
FOR the past six years we have experienced an economic hurricane. An intensive study of the behavior of a single industry in a great depression may throw some light on the causes and effects of these tremendous fluctuations in business activity. The automobile industry is a good one to study, for it is a very large industry, affecting in some way nearly every inhabitant, and it is an industry with very comprehensive and timely statistics.

From 1929 to 1932 the number of units produced declined by 74.6 per cent and the value of the cars produced declined by 77.8 per cent. The decline in output suffered by the automobile industry was of staggering proportions, so that the behavior of the

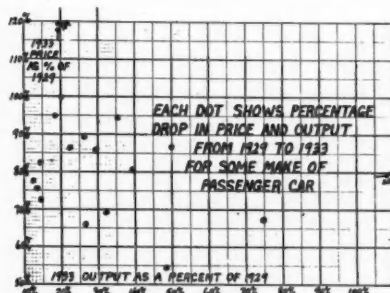
industry enables us to study the effects of a business depression in exaggerated form.

Now the 12-month periods in which production was at a maximum or a minimum may not have coincided with any calendar year. Passenger car production reached a maximum in the year centered at March 31, 1929. The same 12-month period was a maximum for retail sales of passenger cars in the United States.

Commercial car and truck production reached a 12-month maximum in the year centered at Jan. 31, 1929. The 12 months' minima for these three curves were the years centered at June 30, 1932, for passenger car production; at Sept. 30, 1932, for the retail sales of passenger cars, and at Oct. 31, 1932, for truck production. The elapsed time from the maximum to the minimum year was 39 months for passenger car output, 45 months for truck output, and 42 months for passenger car retail



Commercial car and truck production in the United States and Canada as a per cent of total automobile production



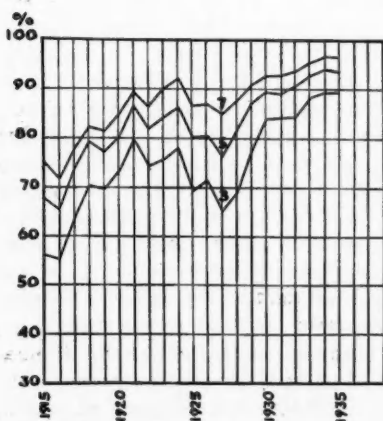
sales in the United States. We may say with approximate accuracy that the industry went into a nose dive in September, 1929, and reached bottom about December, 1932.

Comparing the maximum and minimum years, we find that passenger car output declined by 76.2 per cent, passenger car retail sales declined by 73.4 per cent, and truck output declined by 72.6 per cent. The poorest year yielded only a quarter as much business as the best year. The decline in the automotive industry was ushered in by a dramatic event—the collapse of Sept. 6, 1929, on the New York Stock Exchange. And the end of the decline was marked by another dramatic event, when, on the morning of Feb. 14, 1932, we read, with dismay and apprehension, that all the banks of Michigan had

closed their doors. Boxed in between these dramatic events was the most catastrophic decline in the history of the industry. For the purposes of analyzing social forces, this great collapse of an industry should mean to the economist what an eclipse of the sun means to the astronomer, or what a volcanic eruption means to the geologist. As we all know, this cataclysm in the United States was part of a great tidal wave which was engulfing the whole world.

In every country sales declined in 1930 below the 1929 level; in every country (except Great Britain and Canada) 1932 was the low year in sales; in every country sales advanced in 1933; and in every country sales were greater in 1934 than in 1933. If automobile sales are a fair criterion, and I believe they are, a world-wide recovery has been in progress since 1932. And the recovery in Great Britain and the Union of South Africa has been more pronounced than in the other countries shown on the chart.

Judged by automobile sales, the states in the eastern industrial and urban areas suffered less from the depression than the states which are devoted more to mining and agriculture. This parallels the world situation, for automobile sales declined less in Great Britain, an industrial nation, than in



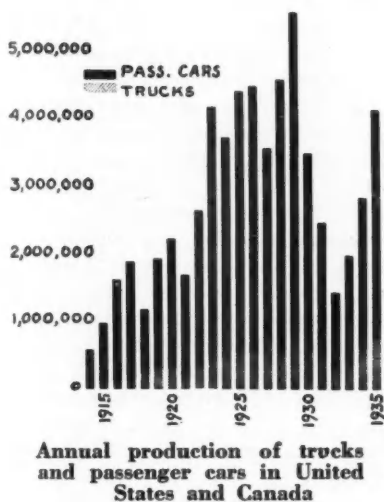
Per cent of automobiles produced each year in the United States and Canada by the leading 3, 5 and 7 manufacturers

This article is the major portion of an address by Mr. Scoville before a recent meeting of the Econometric Society in New York.

le Industry During Depression

By JOHN W. SCOVILLE
Chief Statistician,
Chrysler Corp.

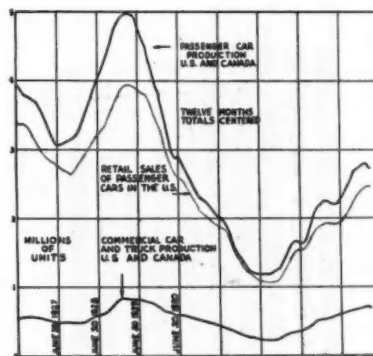
Australia and Brazil. In order to compare passenger car sales in urban and rural areas, we divided the counties of the United States into four groups, each group representing about 25 per cent



of the total market. Sales in the rural counties declined more than sales in the big cities, and since 1932 the rural areas show the greatest recovery. In 1932 the per cent of passenger cars sold in the metropolitan counties reached a maximum and the per cent sold in the rural counties reached a minimum. Since 1932 the curves have tended to resume the positions which they occupied before the depression.

To the extent that automobile sales are an index of income, farmers and artisans suffered most in the depression, and professional people suffered least. Each group reached a peak of car buying in 1929; each group declined to a low point in 1932; and each group since 1932 has increased its car purchases each year. Note that the farmers, who bought about 650,000 new cars in 1929, bought only 55,000 in 1932, a decline of 85 per cent; the artisans' group, which includes mechanics, masons, painters, carpenters, factory employees, laborers, etc., bought about 840,000 new cars in 1929 and only 145,000 in 1932, a decline of

82.5 per cent; the financial group, including bankers, brokers, manufacturers, retired persons, etc., bought 235,800 new cars in 1929 and only 106,000 in 1932, a decline of 55 per cent; tradespeople, including grocers, jewelers, salesmen, merchants, etc., bought 1,079,000 cars in 1929 and only 345,000 in 1932, a decline of 68 per cent; the professional group, which includes physicians, lawyers, teachers, clergymen, etc., bought 352,000 new cars in 1929 and 182,000 in 1932, a decline of only 49 per cent. Many professional people in the depression had fairly constant incomes, and the low cost of food, rent and clothing gave some of them more buying power than they had in 1929.



The gain in buying in 1936 over 1935, to bring passenger car sales back to the level of 1929, would need to be about as follows:

		Per Cent Gain Over 1935
Farmers	382,000	138
Artisans	464,000	124
Tradespeople	263,000	32
Financial	6,300	3
Miscellaneous	101,000	16
	1,216,300	

Nearly 70 per cent of the gain would need to come from farmers and artisans, and each of these groups would need to more than double the number of cars purchased in 1935 to bring the industry back to the 1929 level.

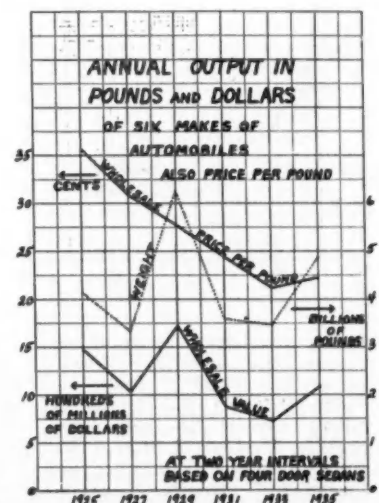
In the last decade about 15 per cent



of the output has been exported. In the preceding decade about 10½ per cent was exported. The per cent of American production which was exported rose rapidly from 1921 to 1927 and was high in the boom year 1929. While domestic sales fell off drastically in the depression, exports declined still more, and the per cent which was exported declined from 1929 to 1933. Foreign countries not only increased their duties on American cars, but in many cases they established quotas to limit the sale of American cars.

Let us now consider what happened to prices. We are confronted here with a difficult problem, for the automobiles have been changing in value as well as in price.

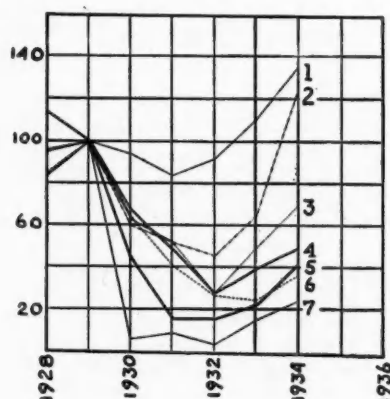
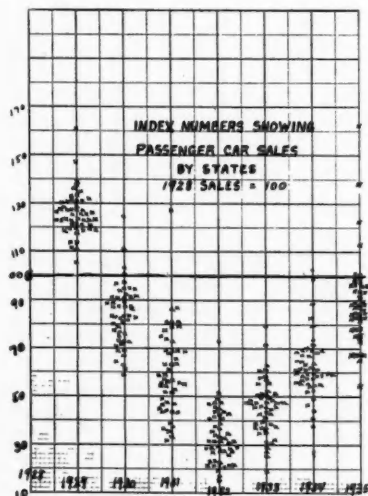
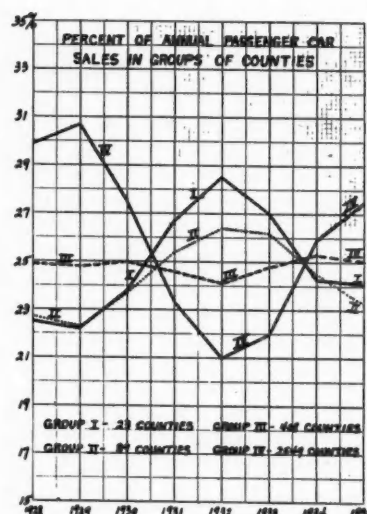
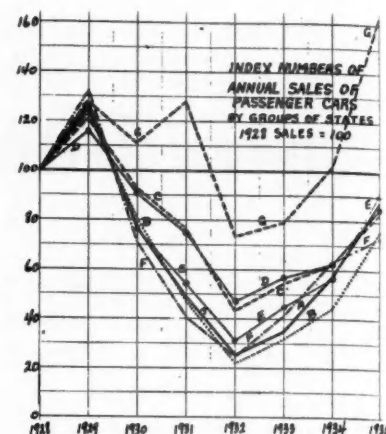
Here is a 1914 Pierce-Arrow which sold for \$5,200—a very swanky car in its day. Here is a 1936 Plymouth, which sells for about one-seventh the



price of the Pierce-Arrow. Yet no owner of a new Ford, new Chevrolet, or new Plymouth would exchange his car for the Pierce-Arrow of 20 years ago. If a farmer sold a calf for \$10, and if a year later this same animal sold for \$40 and two years later for \$65, it would be difficult to use these figures to construct index numbers on the price of beef, for the animal was increasing in weight and in value, as well as in price. Likewise, if a six-year-old horse sold for \$200 and four years later it sold for \$125, we could hardly use these figures to determine the trend of horse prices. In fact, unless we can express quantitatively the values of the cars produced each year in terms of gasoline economy, speed, longevity, repair costs, appearance, riding comfort, etc., the construction of an index number of automobile prices is impossible. Lard, wheat, copper and cotton are of nearly constant quality, one year with another. But

automobiles have improved so rapidly in quality that the construction of satisfactory index numbers of automobile prices is, in my opinion, an impossibility.

From 1927 to 1933 the wholesale prices of the passenger cars produced each year declined by 33.4 per cent, while the Bureau of Labor Statistics index shows a decline of only 11.7 per cent. Perhaps some of the critics who have complained about the rigidity of



Index numbers of annual passenger car sales for certain countries, 1929 = 100. 1—Great Britain; 2—Union of South Africa; 3—India (Imports); 4—United States; 5—Australia and Tasmania; 6—Canada; 7—Brazil (Imports)



Number of new passenger car dealers in the United States at the end of the year

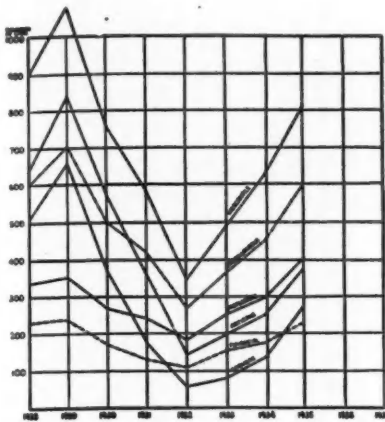
automobile prices were using the Bureau's index and hence were not familiar with the extent of the decline of automobile prices.

Let us now compare automobile prices with the U. S. B. L. S. index of wholesale prices of all commodities and with the prices of farm products, this time taking the period 1909 to 1914 as the base period. In this base period the prices of agricultural products and industrial products were supposed

to be in proper relationship one to another. Those who object to this base period for automobile prices because of the improvements that have taken place in automobile manufacturing must reject the whole theory of price parity based on the prices which existed a generation ago, for there have been technological improvements in all manufacturing, in mining and in agriculture. Also the changes in the demand for various commodities, as well as changes in technology, would affect price ratios. So if we accept the theory that deviations from the price ratios that existed a generation ago are evils which should be corrected, then we see from the chart that automobile prices are too low and have been below parity since 1912. To be exact, automobile prices should be increased by 121 per cent to bring them back to a parity with the prices of farm products.

From 1915 to 1919 agricultural prices were so flexible that they increased by 113 per cent and all commodities increased by 100 per cent, while automobile prices were more rigid and increased by only 35 per cent. From 1921 to 1927, farm prices increased by 17 per cent, while automobile prices decreased by 15 per cent. While farm prices increased from 1921 to 1929 and then fell abruptly, automobile prices declined in 10 of the 13 years from 1920 to 1933. In the last 21 years there were only nine years in which farm prices declined, while automobile prices declined in 13 of these 21 years.

Nearly all the money spent for an automobile is paid out in wages. The raw materials, iron ore and copper ore in the ground, trees in the forest, etc., that are used in making an automobile are worth probably less than \$25. In making an automobile, wages are paid to copper miners and coal miners, to railroad employees, to steel workers, to the workmen who build and design the machines used in the factories, to textile workers, to farmers who grow cotton, to the people who grow, mine,



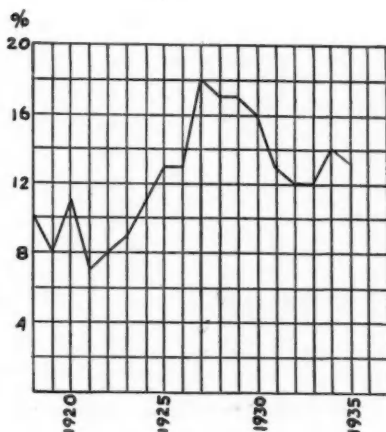
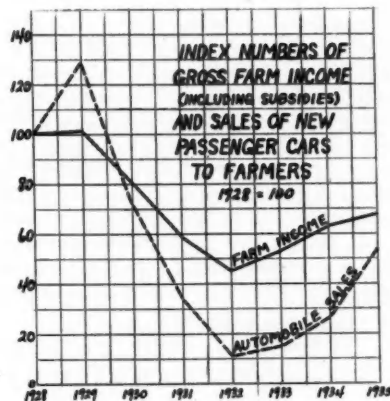
Annual sales of passenger cars by occupational groups

transport, and process the materials that go to make up an automobile. I suppose that over 80 per cent of the money paid for an automobile has already been spent for wages—and about three-quarters of these wage payments have been made to workmen outside the automobile factories. From 1929 to 1933 the cost of labor declined about 24 per cent. But as the production of automobiles declined, it required more hours of labor to make a car, as the reduction in the number of watchmen, foremen, engineers, etc., cannot parallel the decline in output. For short periods the comparative stability of automobile prices is due to the rigidity of the principal cost ingredient—which is labor. The chart shows that in 20 years the price of labor has about doubled and the price of automobiles has declined about 50 per cent. In 1934 it required only a quarter as much labor to buy a car as in the base period, and only half as much as in the period 1917 to 1919. This cheapening of cars in terms of the most fundamental unit of value—an hour of human labor—has not caused unemployment. It has made it possible for the masses to own cars and has thereby greatly increased employment. While in our country we have perhaps 7 per cent of the population of the world, our people own 71 per cent of all the automobiles in the world. In ten years the cost (average price) per passenger car declined 36.6 per cent, the cost per pound declined 44 per cent and the cost per horsepower declined 75.2 per cent. While the price was declining, the quality was improving.

In regard to prices, the automotive industry can be proud of its record. The policy has always been better cars at lower prices. And as long as the prices declined and the values increased, "the rose will smell as sweet by any name."

How long do automobiles last?

Let me remark here that no method is available for measuring the longevity of cars produced this year. The only car life we can hope to measure is the life of cars produced six or more years ago. But before we attempt to measure car life, we must answer another question. How many cars were



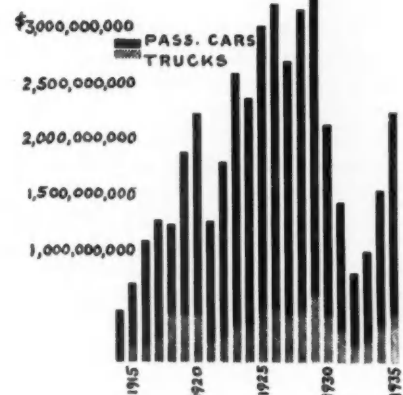
Per cent of United States and Canada automobile production sold outside of the United States by years

in use at a given date? No one knows very exactly how many cars are in use at a given date. The death of a car is a nebulous affair—it is difficult to tell when the car made its last mile. Registration figures are not exact. The same car may be registered in more than one state. An old license plate may be transferred from an old car to a new car. The new car may be driven with a license plate of the year before. Not all of the plates issued by the License Bureau may be sold to car owners. Car life during the last 15 to 20 years has slowly increased. Not all makes of cars are equally good.

While the number of passenger cars in use declined in the depression by 10 per cent, the unused mileage in the

hands of the car owners declined by 37 per cent. A new car may be considered as a transportation ticket good for 77,500 miles, a ticket, if you please, with 77,500 coupons. As the car is driven, the owner tears of the coupon. On January 1, 1930, the passenger cars in the hands of owners were unused tickets good for 1,067 billion miles of travel. On January 1, 1935, the cars in use had only 671 billion miles of transportation in them. The number of passenger cars in use on January 1, 1936, will be less than 500,000 below the all time peak. But it would require 5,000,000 new cars produced overnight to bring the unused mileage back to the peak. It was because the American people had over a trillion miles of transportation in their garages when the depression began that car sales fell off so drastically.

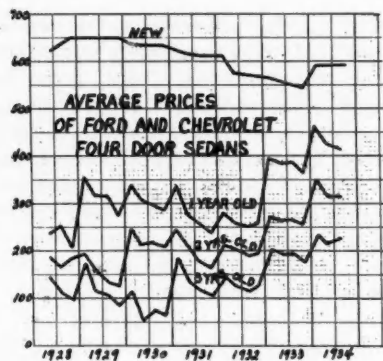
The original data on used car prices is far from perfect. But it appears that the used cars selling in largest volume did not decline greatly in price during the depression, and that the



Annual wholesale value of trucks and passenger cars produced in the United States and Canada



Index numbers of automobile wholesale prices—1926 = 100



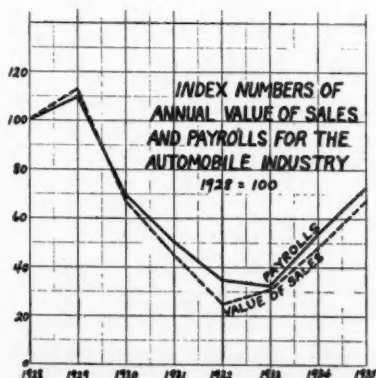
trend of used car prices since 1932 has been sharply upward. Several forces were at work. On the demand side, many people who in prosperous times would have bought new cars, were forced to buy used cars in the depression years. Then the reduced sales of new cars, reduced by the supply of used cars handled by dealers. The used cars were sold by thousands of dealers to millions of buyers and the prices were not administered by the factories.

So much has been said about the evils of used car trading that we are likely to overlook two important advantages:

1. The billions of dollars invested in the cars now in use is money which has been earmarked or set aside for the purchase of new cars.
2. Millions of people with low incomes own cars which cost them less than \$200 each.

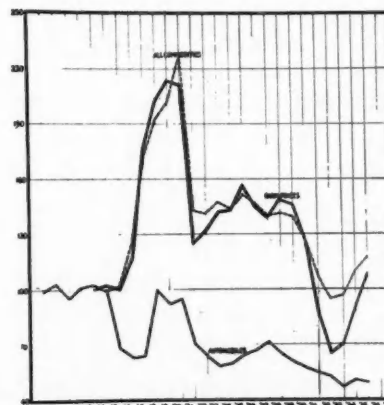
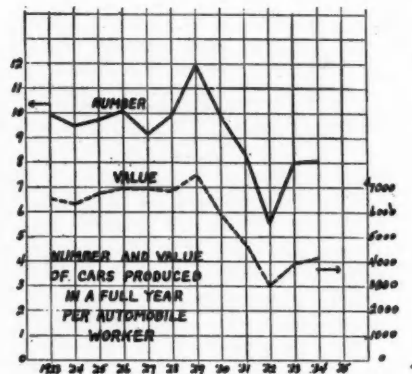
The process of handing down cars from people of higher incomes to persons of lower incomes has so extended car ownership in the United States that our entire population could be riding in automobiles at the same instant.

Having explored some of the effects of the depression on automobile output and prices, let us now consider what happened to labor. The automobile industry has always paid high wages. For each year from 1923 to 1935, automobile workers have secured higher earnings than the average for all factory workers. In 1935, this advantage



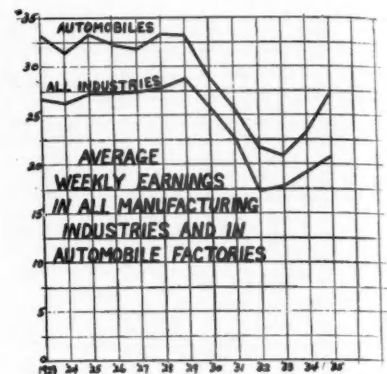
enjoyed by automobile workers amounts to 30 per cent. It has always been the policy of automobile manufacturers to pay as high wages as possible, with due regard to the interests of the consuming public.

Beginning with the stock market crash in 1929, a wave of fear, doubt and uncertainty swept over our people



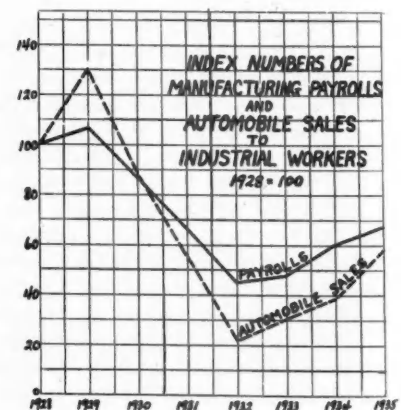
Index numbers of wholesale prices. 1909-1914 = 100

and gained momentum for over three years. As the public ordered fewer and fewer cars, there was less and less work available in the automobile factories. You will note that payrolls declined less than sales, and that the workers in the depression received a larger part of the money spent for cars. A good deal of fuss was made over the seasonal fluctuations in automobile employment. Prior to the depression, employment in automobile factories was not very seasonal. In the depression years, estimates were made of the probable demand for cars and materials and workmen were engaged on the basis of the estimates. But as business grew progressively worse, and the estimates made at the beginning of the year were found to be too high, it was necessary to bring the working force down to lower levels.

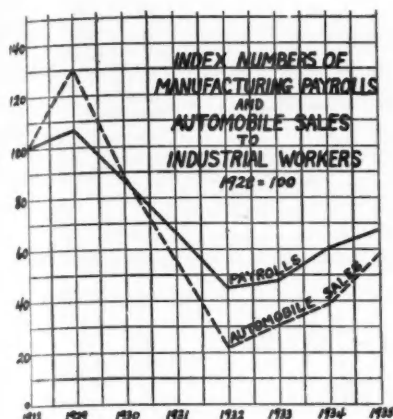


This went on for several years, and the seasonal fluctuation in the working force was greatly aggravated by the depression. The industry is making a real effort to stabilize employment by introducing new models earlier, by building banks of parts in the slack season, by shifting workmen from one department to another, and by stocking dealers with cars in winter months. Many of these things were done in the past, but the industry is making a more determined effort to level off employment than ever before.

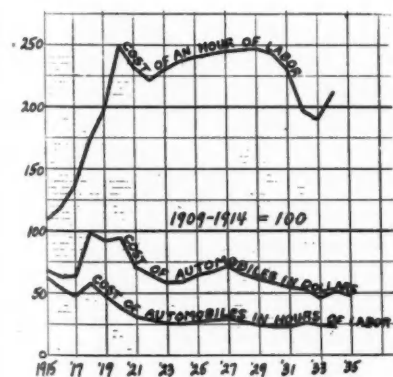
The facts are, that our workers were hurt by the great decline in the money available for payrolls. It was the small amount of work available and not its distribution throughout the



year, that caused the hardships and suffering. We heard again the century old delusion that machines were causing unemployment. It is evident that workmen have not been displaced by machines. The greater refinements in manufacture and the new things that have been added to the cars have absorbed the workmen that have been released in certain departments by labor saving machines. The automotive industry has greatly increased the demand for labor, for it has brought something new to humanity—it has enormously increased the mobility of



people. In 1910, the average per capita travel per annum in steam cars, electric trains and automobiles was about 65 miles. By 1920 the average person was traveling 1620 miles by these conveyances and by 1930 the average person was traveling 3620 miles per year. From 1920 to 1930 the mobility of our people was more than doubled. The automobile has transformed us from turtles to jack-rabbits. In the U. S. census figures of the population by occupations, we can sort out certain occupations that are connected with automotive transportation, for example, workmen in automobile factories, and rubber factories, garage owners, automobile dealers, oil and gas well

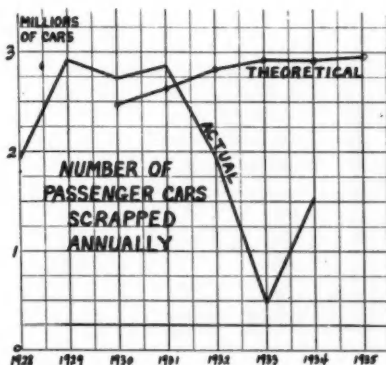
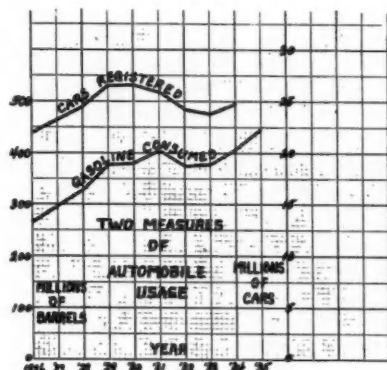


operatives, etc. These groups total up as follows:

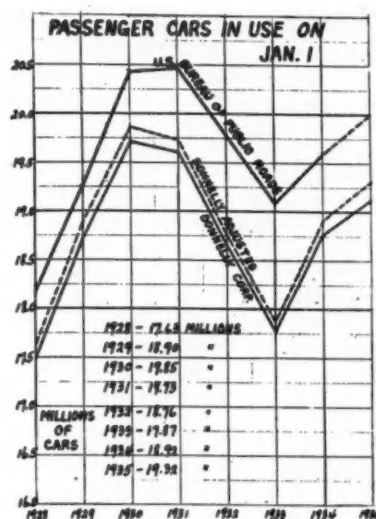
1910	167,704
1920	815,140
1930	1,671,431

The number increased by 385 per cent from 1910 to 1920 and it increased by 105 per cent from 1920 to 1930. Let's do a little quick figuring. It costs close to \$200 a year to keep a car running—that is let us say the expense for repairs, gasoline, oil, tires, license fee, batteries, etc. If there are 25,000,000 cars in use, this amounts to \$5,000,000,-

000 a year. Most of this money is spent for labor. The license fee goes to pay the workmen on the highways. The gasoline money goes to the filling station attendant, to the workers in the oil fields, etc. If the average workman gets \$1,000 a year, this money would go to 5,000,000 workmen. If \$3,000,000,000 a year is spent for new cars, this money would employ 3,000,000 workmen at \$1,000 each. This



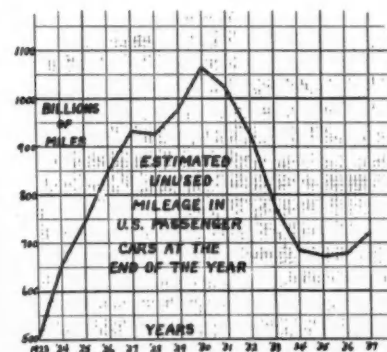
would give us a total of 8,000,000 workmen. Then we have 2,629,000 truck and bus drivers. This brings us up to 10,639,000 persons. Facts and Figures estimates that 5,065,000 persons are employed directly and indirectly in the automotive industry. This estimate is much too low. It does not include the workers who make the steel, the paint and cloth used in the cars. It does not include the carpenters who build the garages, or the wood choppers who cut the trees which make the pulp which makes the paper on which is printed the automobile advertisements. I do not know how many persons are employed in automotive transport—but it must be over 8,000,000 or about one-sixth of the gainfully employed. Probably not more than 3,000,000 of these have been taken from the ranks of the railroad employees, the carriage makers and the harness makers. That leaves about 5,000,000 extra jobs created by the ad-



vent of the automobile. And why was this possible? Because of the labor saving devices in the automobile factories, the tire factories, the steel mills, the paint factories, etc. These machines have created employment for millions. Without our labor saving machines we would be staying at home cutting wheat with a sickle, threshing it with a flail and grinding it in a mortar.

Hourly wage rates in the automobile factories are somewhat higher now than in 1929. Hours of work are less, and this reduces the weekly earnings. But the cost of living is lower than in 1929 and the real wages of automobile workers are greater than in 1929. The manufacture of automobiles is by its nature a large scale enterprise.

During the past twenty years, the business has been concentrated in the hands of a few producers. This process continued in the depression. This concentration has not resulted in monopolistic prices. The public is getting the advantages of mass production without being oppressed by a monopoly. This concentration has proceeded naturally as a result of competition and has been brought about by the car buying public. This development illustrates very nicely the process by which society, in a capitalistic and competitive system, secures a more and



PROFITS into PRODUCTION!

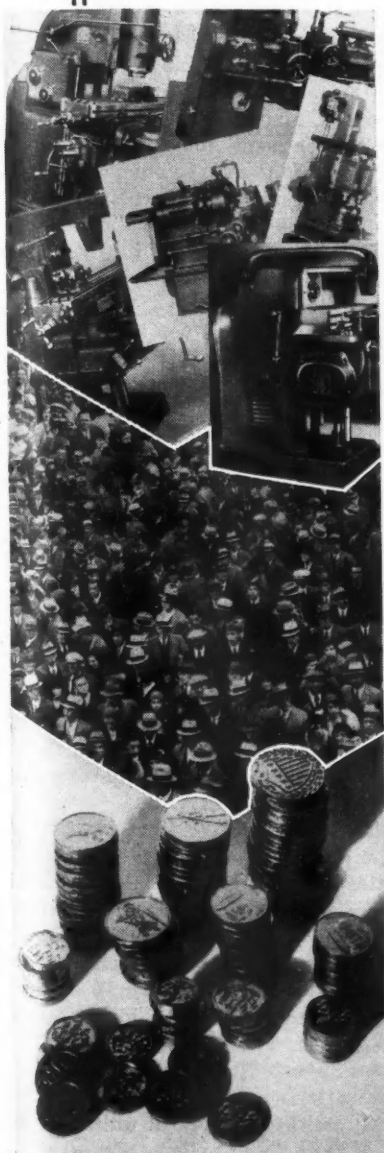


"SOMETHING like 85 per cent of the present motor industry's capital investment represents profits that have been reinvested in the business—the industry . . . has virtually financed itself." This magnificent example of the social utility of profits was offered by Dr. Ralph C. Epstein,* dean of the School of Business Administration of the University of Buffalo, in a radio address on Jan. 19. The fact was the prelude to an important question.

"... Would we have had," Dr. Epstein asked, "an automobile industry and would we have had automobiles such as we do today, without the lure of prospective profits to tempt the Henry Fords, the R. E. Olds, the Alfred Sloans, the Walter Chryslers, the R. D. Chapins, the Howard Coffins, and the countless others who have contributed their energies, assumed the spectacular risks of earlier days and the less spectacular risks of later—would we have had 4,150,000 such cars as were produced last year, and sold profitably at such low prices as they were—if we had not permitted profits to operate as a motive to drive men on?"

Dr. Epstein raises the question. We believe this: the opportunity for the useful reinvestment of profits is a fundamental part of the American system of enterprise, and that the destruction of this opportunity, whether through excessive taxation or the sterilization of profit through other types of restrictive legislation, would be a fundamental blow at one of the most desirable characteristics of American life.

*Author of "The Automobile Industry" (Shaw, 1928), which remains to date the only full-length study of the economic aspects of the automobile industry.



The Horizons of Business

by Joseph Stagg Lawrence

History in the Making

THROUGHOUT American history the major political parties have successfully avoided the class stratification which has been typical of political party history in other countries. On the Continent commentators have long since accustomed themselves to parties that start at the extreme left of economic dogma and the bottom of the class scale and end at the extreme right, embracing conservative theory. It has been a profound satisfaction to the citizens of this Republic that issues involving government policy have remained on the comparatively high plane of personality and party principle.

Blocs

There have been times when adherents of specific philosophies or interests have attempted to break up the vertical two-party system and substitute therefore the stratification so characteristic of Europe. The Populist and Greenback parties which found their origin in the agrarian distress of the eighties and nineties, the Knights of Labor and the battalions of 16-to-1 bimetalists who rallied around the gifted standard of William Jennings Bryan, all demonstrate the futility of previous efforts to align parties with economic classes. The Single Taxers and the Socialists have never made first base politically.

Wisdom of the Founders

The wise fathers who formulated the basic code of the land were determined to avoid the conflict of economic groups or the arraignment of classes against each other. They added a deep-seated distrust of governmental integrity. For this reason they divided the power of the state among the executive, legislative and judicial branches after severely delimiting through specific enumeration the province within which the authority of the Federal Government might operate. Without the power to manipulate economic interests the appeal of political parties to classes would be futile.

Far-reaching efforts are now under way to circumvent these wise provi-

sions, and the day's news contains evidence that these efforts have already produced results. We refer to the resolution of the United Mine Workers to appropriate funds from its treasury to promote the reelection of the President.

Cashing the Franchise

The New Deal has reached in many directions in an attempt to reorder the national life. A combination of faith in the elasticity of the Constitution and the more or less genuine pressure of an emergency resulted in the passage of legislation definitely directed at the economic interests of large groups. The NRA, the Wagner Labor Relations Act and the Guffey Act all seek to accomplish by law what organized labor has been seeking through its bargaining power and strikes or the threat of strikes. Insofar as these gestures of aid in the realization of group goals fall outside the field of government power demarked by the Constitution they are a reprehensible hoax, for they offer what the state is constitutionally incompetent to deliver. Unfortunately these groups, as the truculent resolution of the United Mine Workers reveals, are not willing to accept disillusionment. They propose to abandon traditional political neutrality and actively enter the campaign for the leader who has made them such alluring overtures. Here is a bloc in the European sense of the word which frankly proposes to use its full political power to secure the maximum of economic advantage. This is an abuse, perhaps prostitution would be better, of the right to vote.

Design for Power

The matter is not confined to the miners. The farmers have just been jolted by the Hoosac Mills case. The Bankhead, Kerr-Smith and TVA Acts all contain similar jolts to other groups which may be felt in the near future. The Social Security Act offers the promised land to millions of the aged and the unfortunate, who feel most frequently the insecurity of modern life.

When the nine referees who constitute the Supreme Court are obliged at frequent intervals to toot their whistles and call Uncle Sam out of bounds it proves profoundly disappointing to the prospective beneficiaries who were following the play with deep interest. It places the court in the position of making such a nuisance of itself, in the eyes of the disappointed, as to create a growing demand for a curb on its power, a constitutional amendment, or both.

There is more than a faint suspicion that this might be the object of an acute design. Promise the farmers fat checks for doing nothing, for "preserving the fertility of their soil," or what have you, give them a generous sample of the treatment and then place upon the Supreme Court the onus of deprivation. Extend this procedure to the aged and the unemployed, to organized labor. Offer the TVA to those who hold the profit motive impure and private enterprise wicked. Add these groups together and you have a numerically impressive party. All that is required is a pliant court or a slight amendment of the constitution, best by far, a combination of the two. Since the effect is so clear may it not be in order to ask if it has been purposefully pursued?

New Parties

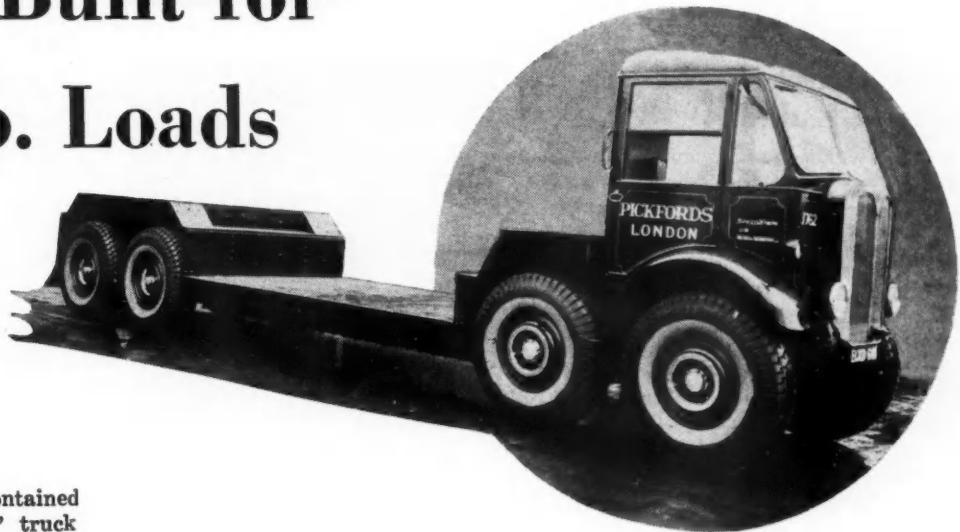
We have here the elements of an entirely new alignment of parties. The action of the United Mine Workers proves that one group at least has not been slow to apprehend the implications of the numerous measures passed at the urgency of the chief executive, "however reasonable the doubts" regarding their constitutionality.

The change will be twofold. It will be impossible for one of the major parties to apply the Government's powers for the benefit of numerically important groups and retain the elements which disapprove such a role. This flight from the party is as clear as the eager accession of hitherto neutral groups. The Talmadge convention is an expression of offended traditional democratic conservatism. The threat of Al Smith "to take a walk" is the

(Turn to page 197, please)

British Eight-Wheel "Crocodile" Truck is Built for 40,000-lb. Loads

By M. W. BOURDON



NEW as a type of self-contained vehicle, the "Crocodile" truck introduced by the Associated Equipment Company, London, England, has been designed primarily for the transport of heavy machinery and other merchandise of concentrated weight. It has eight wheels, four driving and four steering, and a frame that falls to a low level between the fore-and-aft "bogies"; the central platform is 24 in. above ground level and 12 ft. long on a wheelbase (from first axle to rear bogie center) of 23 ft. 3 in.; the overall length is 30 ft. and the unladen weight, 17,500 lb. The maximum useful load capacity is 40,000 lb.

An A.E.C.-Ricardo oil engine developing 110 b.h.p. at 1700 r.p.m. is used, and a four-speed transmission

British A.E.C. eight-wheeled "Crocodile" truck with four-wheel drive and four-wheel steering, for carrying loads of up to 18 long tons. The central platform is only 24 in. above ground level

with an auxiliary gearbox giving an additional low forward ratio. Both rear axles have an underslung worm drive (10.33 to 1); a differential between them ensures uniformity of torque on all four driving wheels.

Tire equipment consists of 12.75 x 20 in. low-pressure Dunlops, all of which take an equal proportion of the load. At 1000 r.p.m. the speed range

is from 1.8 m.p.h. on the low auxiliary gear to 12.7 m.p.h. on the direct high.

The three first examples of this type of truck were built to the order of Pickfords, the nation-wide freight transport organization, to displace trailers constructed on similar lines; the type has proved so successful in Pickfords' service that A.E.C. has now made it one of its regular products.

Standards on Rubber Products

A.S.T.M. Standards on Rubber Products—Published by the American Society for Testing Materials, 260 So. Broad Street, Philadelphia, Pa.

THIS compilation of "A. S. T. M. Standards on Rubber Products," issued for the first time, is sponsored by the Committee on Rubber Products to afford a convenient laboratory standard test manual. It gives all the 21 A. S. T. M. specifications and tests for rubber products, a proposed specification now being considered, and a condensed bibliography.

Included in the compilation are standardized procedures for the following: Physical testing, tension testing, adhesion (friction test,) hardness, abrasion resistance, chemical analysis, adhesion of rubber to metal, compression set, accelerated aging, flexing. Also covered by tests are rubber hose, both braided and wrapped construction, and rubber belting used for power transmission. Specification requirements, including in most cases definite prescribed tests, are given for a num-

ber of products that are extensively used in the automobile industry and many of its allied activities.

Stainless Steel Gets Wide Use

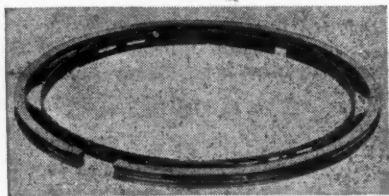
Stainless steel is now being used for at least twenty-four different elements of the automobile, including cowlings, trim, tire covers, radiator caps, door handles, hub caps, lamp brackets, instrument panels, bumper and fender guards.

NEW DEVELOPMENTS

Automotive Parts, Accessories and Production Tools

Perfect Circle Expander Ring of Radical Design

Perfect Circle has announced an expander type piston ring said to be new in principle and radically different in design. The X-90, as it is called, utilizes a series of independent double-leaf spring units equally spaced on a carrier band. Each of these springs operates independently, exerting a pressure against the inner circumference of the ring. Perfect Circle engineers claim that this new ring will contact tapered and out-of-round cylinders effectively throughout the stroke, even at the highest driving speeds, in spite



Perfect Circle

of the fact that the wall pressure is no higher than with the conventional one-piece ring.

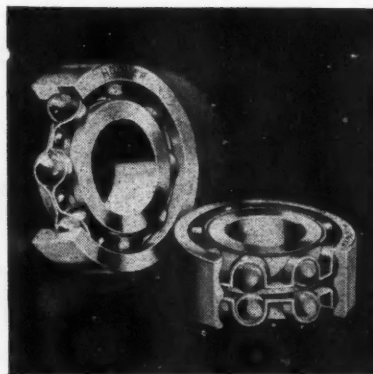
The X-90, a product of The Perfect Circle Co., Hagerstown, Ind., is supplied either as a compression or as an oil control ring.

Door Bumper Shoe of Durez

General Plastics, Inc., North Tonawanda, N. Y., has developed a new Durez material No. 1564, which is a phenolic molding compound said to possess high impact strength and friction resistance. A recent interesting application of this material is the small bumper shoe which bears against the metal wedge on automobile doors, supporting them and preventing rattling.

Hoover Ball Bearing Line Increased

The Hoover Steel Ball Co. of Ann Arbor, Mich., manufacturer of ball and tapered roller bearings, announces the addition of 75 new sizes of radial and angular contact type ball bearings to

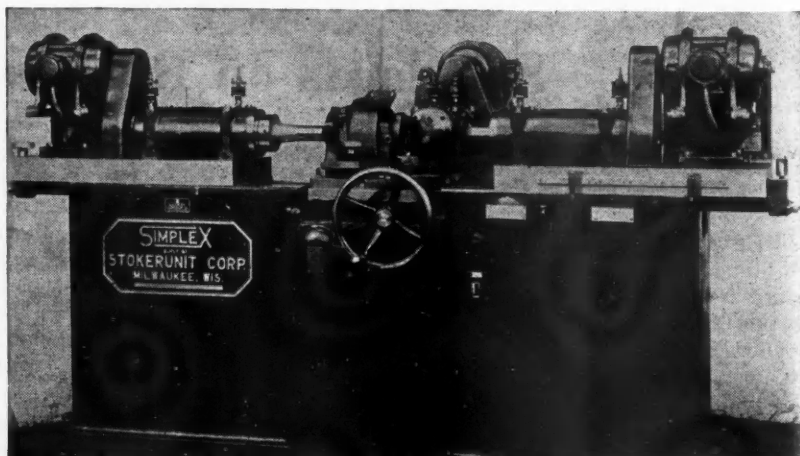


New Hoover Ball Bearings

its present line. These additions embrace both the single and double row types, and are available with one or two lubra-seal plates if desired.

Bores 3 Faces Simultaneously

The Simplex precision unit boring machine provides for the boring of several holes on different faces of a part simultaneously. The machine has a heavy, cast bed with either 2 or 3 sets of vee and flat ways, each carrying a platen to support and guide the spindles. Either manual or full automatic operations is available. With the latter, the electrical control operates a traverse motor which advances the platens to the feeding position and also returns them after the cut. Each platen has



Simplex Precision Unit Boring Machine

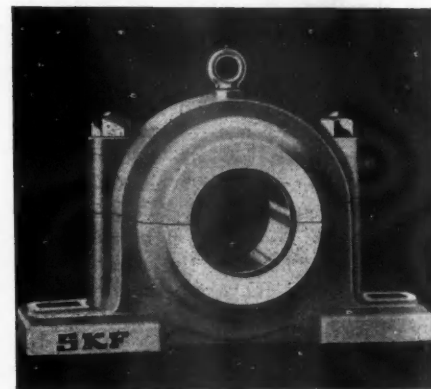
individual adjustment in relation to the work, but normally all feed at the same rate. Spindle speeds ranging from 300 to 5000 r.p.m. can be provided.

The Simplex machine is built by the Stoker Unit Corp., Milwaukee, Wis.

SKF Pillow Block Has Spherical Roller Bearing

The type SA pillow block, introduced by SKF Industries, Inc., Philadelphia, employs the SKF self-aligning spherical roller bearing designed to carry high radial and high thrust loads in either direction. This bearing has positively guided rollers, and is said not to require any adjustment. Felt sealing rings are used to shield against dirt.

The split pillow block construction is said to aid installation and inspection. The lower half is set in position and bolted down, the bearing mounted



SKF Pillow Block

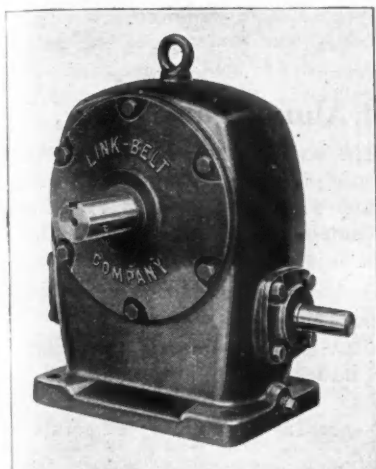
on the shaft, and the upper half then bolted in place. The step joints insure absolute alignment of the two halves of the housing.

NEW DEVELOPMENTS

Automotive Parts, Accessories and Production Tools

Link-Belt Worm Gear Speed Reducers

Announcement is made by Link-Belt Co., Philadelphia, that it has developed a new line of cut-tooth worm gear speed reducers, which are available in a wide range of ratios and capacities. The output shaft, with its phosphor bronze

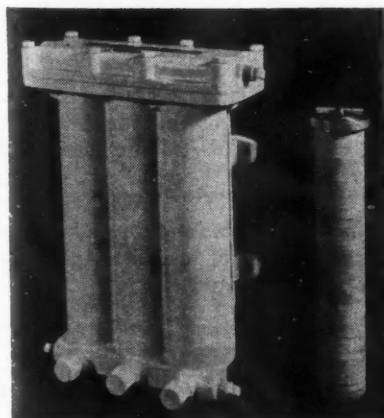


Link-Belt Worm Gear Speed Reducer

worm wheel, can be located either above or below the worm shaft. All units are mounted on tapered roller bearings and are provided with automatic lubrication.

Diesel Fuel Oil Filter Uses Paper Discs

The type F-3 Skinner Stream-Line filter has been developed to meet the requirement of removing all impurities from fuel oil, even when such impurities are microscopic or of the colloidal order, for successful Diesel engine performance. The fuel transfer pump dis-



Diesel Fuel Filter

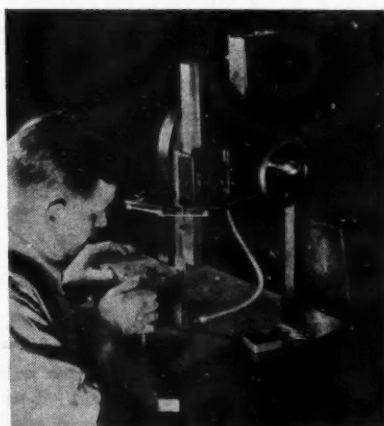
charge is connected to the lower header, delivering oil at the required pressure into the filter-shell, where it passes between the hundreds of specially prepared paper discs which compose the elements or filter packs. The distance between the discs is claimed not to exceed 1/250,000 of an inch.

The operation of the filter continues until the impurities removed from the oil offer such resistance to normal flow as to retard the capacity, when the filter can be cleaned by opening in turn each of the three nuts on the bottom header. This cleaning can be accomplished without stopping the engine.

The Skinner filter is a product of Skinner Purifiers, Inc., 2231 Dalzelle St., Detroit, Mich.

Continental Band Polishing Machine

The Continental sawing and filing machine, recently described in *Automotive Industries*, is now also available for continuous grinding and polishing,

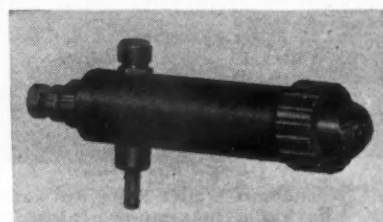


Band Polishing Machine

through the development of suitable bands of emery cloth that can be mounted on the pulleys of the machine. These endless bands are supplied in the three different grits conventionally used in shops for polishing. This equipment is supplied by Continental Machine Specialties, Inc., Minneapolis, Minn.

Spray Gun For Acids

The DeVilbiss Company, Toledo, Ohio, has developed a Bakelite spray gun for spraying acids or materials

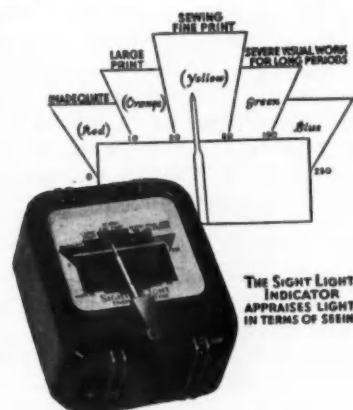


Bakelite Spray Gun

corrosive to steel, brass and other metals. This gun has a fluid adjustment and is semi-automatic in operation.

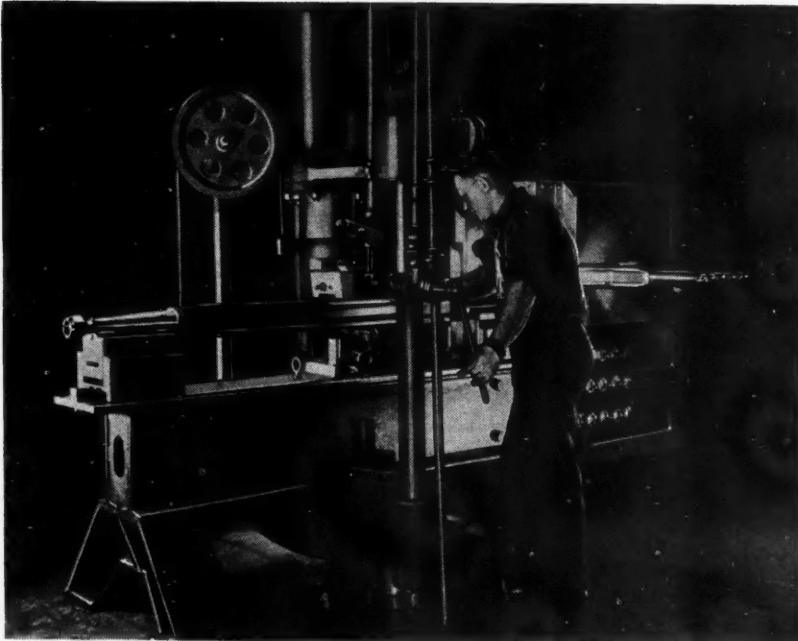
Sight Light Indicator

As a companion to the Sight Meter, introduced a few years ago, The Sight Light Corp., 342 Madison Ave., New York City, has developed the Sight Light Indicator. This instrument converts light energy into electricity and indicates the strength of the current produced by moving the pointer of an electric meter. No batteries or outside current supply is needed, and the instrument indicates intensities from 0 to 250 foot candles. The scale face is printed in red, orange, yellow, green



Measure Light

and blue, the first two indicating inadequate light, and the last three satisfactory illumination.



Fruehauf trailer axles are cambered on this powerful press having a maximum pressure of 30 tons. The operation takes from 15 to 30 tons pressure depending upon the size of the beam. The set-up consists of the press and a gas-fired furnace in which the axle center is heated to 500 deg. F. Axles are minutely inspected after cambering to check alignment as well as degree of camber.

Durez Doings

To provide notes on product improvement through the use of molded plastics, General Plastics has brought out a new publication—*Durez News*—of which Vol. 1, No. 1 is on our desk. If you are interested in molded products or even if you are interested just in keeping up to date, you should get it regularly. See us about getting your name on the mailing list.

Ball Manual

A very useful and handsome engineering manual on ball bearing applications is about to be distributed by Fafnir. It is of the spiral-bound type, loose leaf, and divided into a number of logical sections for convenience. One of the most important of the sections deals with the calculation of bearing loads in typical automotive settings.

Hard Seats

Plymouth has just installed the first machine of a battery to handle the grinding of hard valve seat inserts. It's a case of doing something that everyone said couldn't be done. The machine is a three-head, six-spindle, high-speed unit built by Hall Mfg., who, as you will recall, built the first portable units used by Plymouth when that organization adopted tool steel inserts for the exhaust valve ports. The new Hall

machine is fully automatic and is expected to produce at least 90 blocks per hour, as a conservative estimate.

With Rubber

A unique universal joint incorporating trunnions and bearings of durable molded rubber has been used experimentally by a number of companies during the past year. It originated in Europe where it has given excellent service for several years. In this country, the universal is used in large quantities for industrial service but has not yet been offered to automotive manufacturers as a production job. Those in the know claim great things for this joint.

Guide Posts

Many organizations realize the importance of the foreman as the keyman in the factory executive set-up. And much of the planning and cost-reduction is now his responsibility. However, how many have defined the executive problem as it has been done at Packard? Instead of telling the foreman—"go out and save money for us"—Packard says, "your job is to watch the following factors, control them, and report progress regularly." The factors are: 1. Quality, 2. Quantity, 3. Economy, 4. Safety and good house-keeping. Here are indeed some tangible and laudable objectives.

PRODUCTION LINES

Of Aluminum

The score is even on the aluminum license plates for 1936. Next year four states will adopt the silvery color on its automobile plates. To date the report is:

Oregon—black numerals on aluminum.

Utah—black numerals on aluminum.

Kentucky—aluminum numerals on black.

Nebraska—aluminum numerals on black.

Diverse Applications

The recent S.A.E. annual meeting display by the Acheson Colloids Corp. showed in extremely interesting fashion the diversified applications of colloidal graphite. Although the best known application is that of producing "graphoid" surfaces for crankcase, upper cylinder, and break-in lubrication, this material, according to the company, is also a factor in the following operations:

1. Lubrication of swaging dies for the manufacture of tungsten distributor points.
2. Penetrating oils for the lubrication of springs and dry lubrication for rocker arms.
3. Constituent of aircraft shock absorber fluids.
4. Colloidal graphite in water used in freeing cores from castings in aluminum piston manufacture.
5. As anti-corrosive around battery terminals, tire rims, and exhaust manifolds.
6. Lubrication of door locks, impregnation of gaskets and brake linings, and combination of lubricant and scale-retardant for water pumps. —J. G.

MANUFACTURING
MANAGEMENT
METALLURGY

The Horizons of Business

(Continued from page 192)

revolt of a democratic leader against the course which the party seems to be taking. Alongside Al may be found other distinguished elder statesmen of the party, Ritchie, Ely, Davis, Glass, Raskob, Colby, etc.

A Wholesome Shift

This shift will be wholesome. It will be possible once more to distinguish the platforms of the two parties. The Left Wingers will no longer find it desirable to disguise themselves as orthodox party members. They can appear in their true colors, frankly advocating a change in the American system. There are millions of citizens who will flock to the new banner. That they are pursuing a false and even mischievous goal is a matter of opinion and quite beside the point. If the people wish a constitutional amendment, if they wish power concentrated in the executive, if they wish enterprise to operate under new limitations, that, under a democracy, is their prerogative. It is helpful to have the objects frankly avowed, and this we believe will be the early result of such developments as the resolution of the United Mine Workers, further adverse decisions by the Supreme Court, the mounting irritation of the New Dealers and the reflections upon the wisdom and authority of the court.

Cooling System Design and Maintenance

IN a paper on Cooling System Design and Maintenance, read recently before the Pittsburgh Section of the S.A.E., F. M. Young, president, Young Radiator Co., Racine, Wis., mentioned that on fire trucks and similar equipment, where the engines must be able to develop full power shortly after being started, the cooling water is raised to the boiling point in the engine jackets before cooling begins. This is necessarily a closed system, and a constant pressure and a constant temperature are maintained. The vapors are rapidly condensed, and the condensate is mixed with the remaining water. Less cooling surface is required than with the conventional system.

Mr. Young had a good word for the cross-flow type of radiator. The main objects of the cross-flow system are to prevent the loss of water and to effect the immediate cooling of vapors by bringing them directly into contact with water when the pump forces them into the radiator. However, these objects are accomplished only at the sacrifice of some other desirable features.

With a cross-flow system the tanks are naturally quite long, and a large number of comparatively short tubes are used. Because of the great number of tubes, the velocity of the water is decreased, and on account of the short length of the tubes the rate of heat transfer is decreased, that is, the radiator core is less efficient. Any sediment, such as scale and rust, is naturally more readily retained in the horizontal tubes, and, besides, the rate of flow over the cooling surface of the core is less nearly uniform, which further reduces its efficiency.

The problem of temperature regulation of the lubricating oil is similar to that of temperature control of the

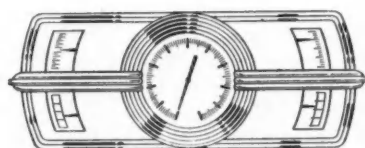
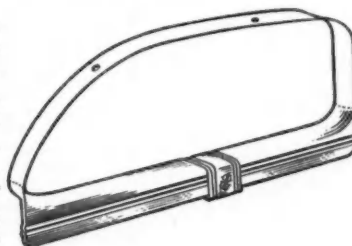
cooling water, in that when starting from cold the oil should be brought up to normal temperature as quickly as possible, whereas in normal operation its temperature should be kept down. At the start the water picks up heat more rapidly than the oil, and a heat interchanger in the cooling system therefore will transfer heat from the cooling water to the oil. At normal working temperatures heat will be transferred from the oil to the cooling water.

Oil coolers should not be installed in the air stream behind the radiator, because the current of cold air at starting would tend to cool the oil further, instead of warming it.

WHAT'S NEW IN *Plastics?*

THIS MONTH: Sills, Garnish Molding, Dash-trim, Defrosters.

Sills, Garnish: Best new use for Durez on motor-cars is sills and garnish, where metal rusts and enamel wears off quickly. Absolutely wear-proof, molded Durez sills can be sculptured to look richer than wood imitation. Light in weight, non-resonant. Can carry engraved emblems. Competitive in cost. For nesting in mold—two-piece them with joints at diagonal corners, or mold the sill and stamp the upper garnish.



Dash Trim:

Many uses for rich, lustrous Durez on the dash. For instance, to match that glove-compartment door shown last month, mold this Durez instrument panel, complete with speedometer rim and integrally molded or applied metal decorations. Fluted rim and border catch highlights. Or merely mold instrument bezels and matching ashtray handle, etc. Many color and decorative possibilities. Permanently glossy.

Defroster: Durez gives accessories new sales-points: light-weight, can't chip, scratch or rust, smarter-looking. Bishop & Babcock's defroster is a two-piece Durez molding with integral grille, holes for controls, shiny flutes on dull ground. Fan which blows heated air is also molded for less resonance and weight.

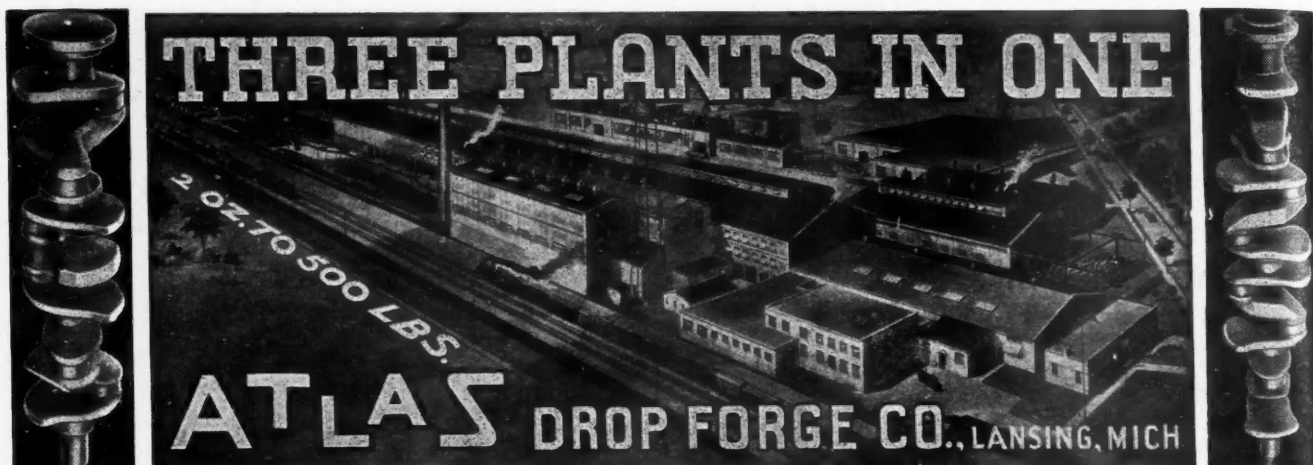


Impregnating Resins: New group of Durez resins developed for impregnating wood or other fibrous materials. They're thermosetting, water-proof the object, prevent dimensional change, have germicidal properties, give good finish. Can be dyed dark colors. Now used for brush-handles. Possible uses: Bus chair-arms, grips, handles, etc.

Durez is a hot-molded plastic applied either in molding compound form or as resins for impregnating, coating, etc., or in sheet form. We are anxious to work with you in adapting this versatile material to your needs. General Plastics, Inc., 22 Walck Road, North Tonawanda, N. Y.

Choice of the Motor Industry

DUREZ • Plastic Materials



◆ BUYERS' GUIDE ◆

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See Alphabetical List of Advertisers on page 40

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